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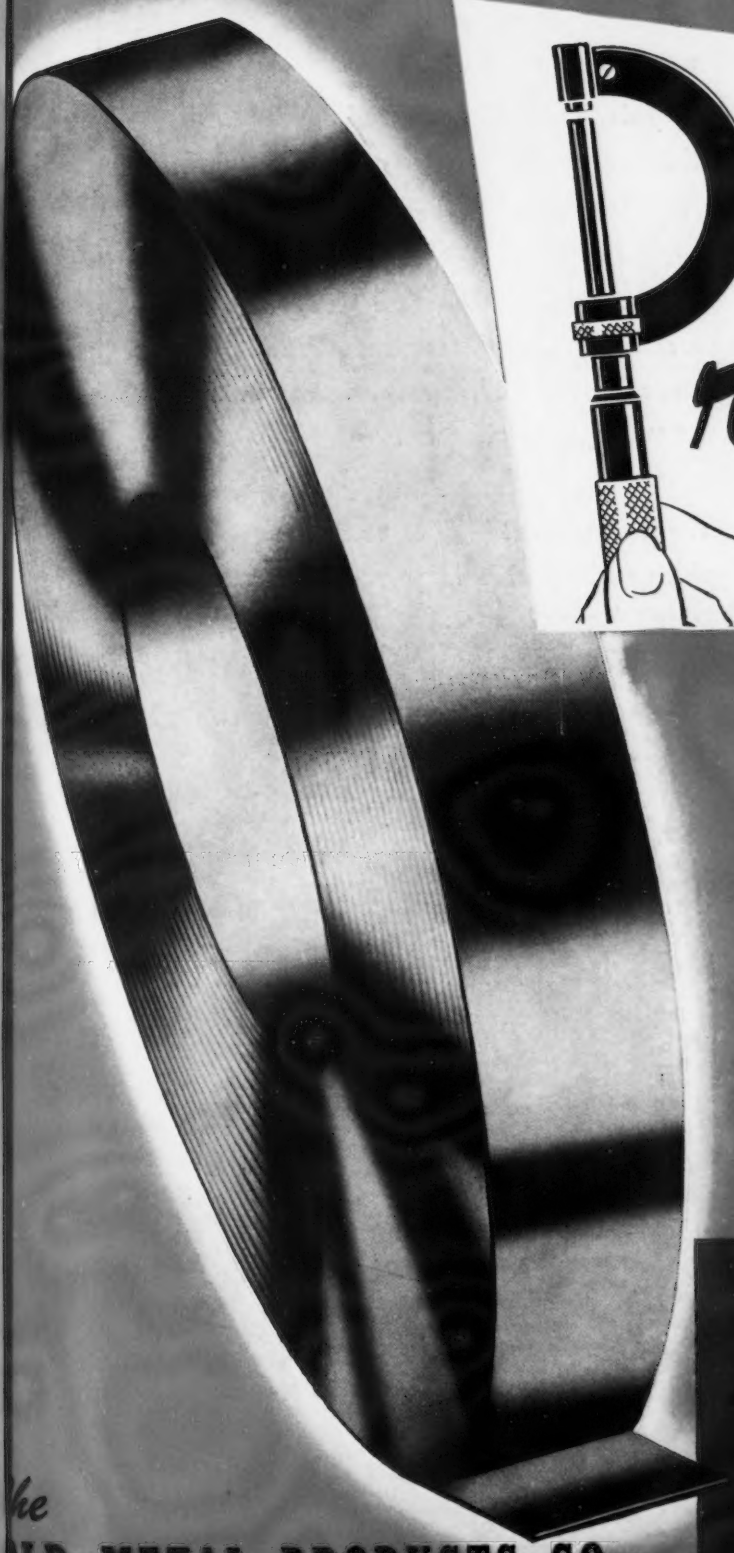

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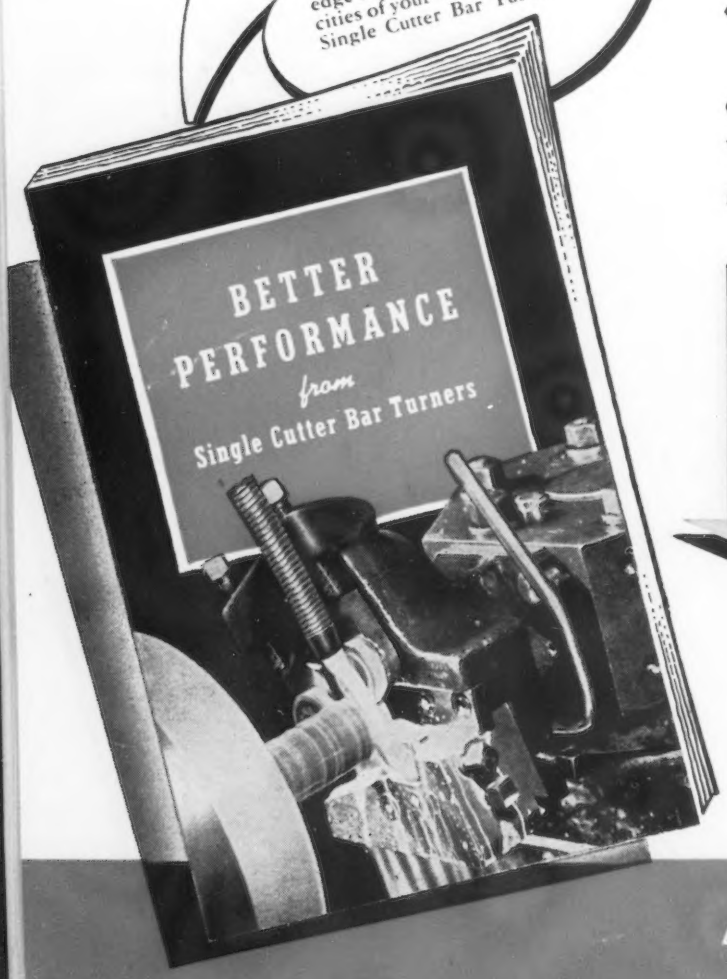

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Want A Government Job After the War?

CONGRESS, which represents the people, does not employ many persons either directly or indirectly and does not compete with private enterprise. But bureaucracy, which does not represent or answer to the people, will be in position after the war to own and operate an amazingly large part of all of our business and industry.

Government, through its bureaus and boards which are headed by political favorites and not by elected appointees, now owns about half of the land in the United States, more than half of all of the aluminum producing capacity, more than enough rubber making capacity to satisfy all expected post-war demands, half of our total machine tool making capacity, more than 90 per cent of our magnesium capacity, more than 90 per cent of our aircraft making facilities, and most of our shipbuilding facilities and shipping. These are but a few of hundreds of instances in varied lines where Government is acquiring what may prove to be a strangle hold on private enterprise.

If this is so, then most of us will be working for Government, under the bureaucrats, after the war. And as prospective employees, we have the right and the need to examine Government's record as an employer.

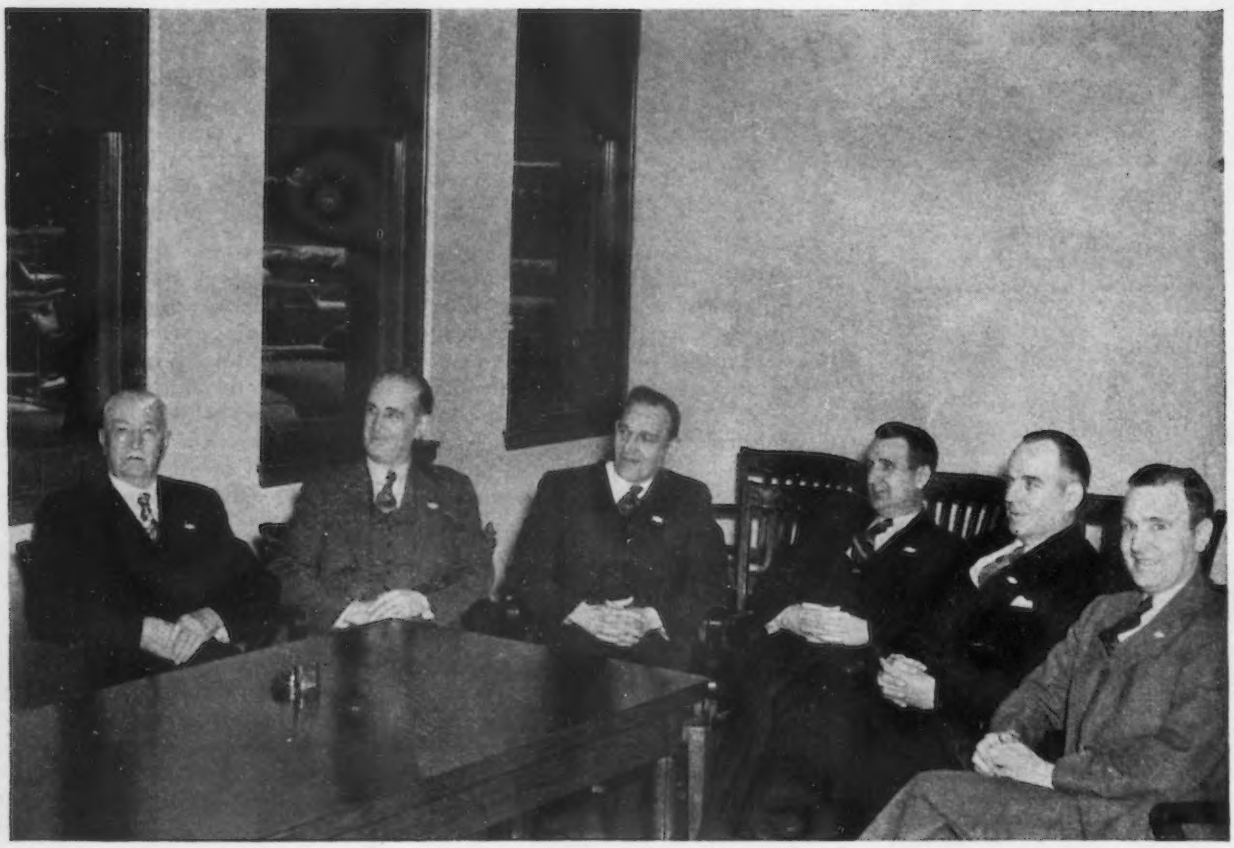
It's not so hot. From the union labor standpoint, while Government recognizes and enforces the Wagner Act as applied to private employers it holds aloof from application of it to itself. Government does not bargain collectively with its employees, does not recognize or sign contracts with unions, does not permit the check-off of union dues nor does it insist that an applicant for a job as postman present an OK from a union boss. Nor does it tolerate strikes either by a minority or a majority. Union labor should reflect upon the extreme unlikelihood of Government changing its attitude in these matters if it becomes their principal after-the-war employer.

From the standpoint of compensation and wages, Government is not a good employer because it is a poor paying one. It pays its chief executive less than half that which is paid to the chief executives of our larger corporate enterprises. It pays its law makers in Congress $10,000 per year to make the laws whereas a capable attorney often gets as much or more as a fee in a single case. It pays a postman less for trudging through streets in heat, cold and storm lugging heavy loads than private industry pays a craneman for sitting indoors on a stool manipulating control levers.

Government is a poor employer because it is an inefficient one. It does a phenomenal monopoly business in postage stamps and loses money on every one it sells. It has not a single bureau or department, to my knowledge, that is self-supporting if judged by the accepted standards of accountancy. For the last ten years, eight of them pre-war and pre-defense it has operated in the red.

What we need for a worthwhile post-war America is more business in Government and less Government in business. We need that maximum exercise of individualism that is meant by "Government of the people, for the people, and by the people." Not the suppression of personal freedom for all classes that is due to Government of the people by the bureaucrats, and for the bureaucrats.

J. H. VanDeventer



Left to right: Charles, Sr.; John; Joseph; Charles, Jr.; Wilfred; and Albert Phillips; whose combined steelmaking experience totals over two centuries.

210 Years of Steelmaking "Know How" in this Inland Family

Back of Inland quality steel are men—men highly trained as technicians, devoting their lives to the making of steel—men such as Charles Phillips, Sr., and his five sons, whose collective steelmaking "know how" totals 210 years.

Steelmaking has been a tradition in the Phillips family since 1880, when Charles Phillips, Sr., then a lad of 12, went to work in a steel mill in England. As each of his five sons—Jack, Joe, Charles, Jr., Wilfred and Albert—came of work age, they, too, went into steel mills.

Today, the Phillips family has accumulated over two centuries of steelmaking experience, of which 123 years have been with Inland.

Much of the credit for Inland quality steel depends on such men—men who search out and develop new methods—men who can engineer equipment, and men who can use it efficiently—men who are deep rooted in the production of steel.

These men, using modern equipment, and advanced methods, now make Inland quality steel for Victory—tomorrow they will make it for Victorious America.

ARMY E NAVY

INLAND STEEL COMPANY

38 South Dearborn Street

Chicago, Illinois

The IRON AGE
AUG. 19, 1943

NEWS FRONT

• Political pressure to reduce the number of Government employees is having widespread repercussions throughout many departments closely related to the war. In ordnance most of the cuts are arbitrary without reference to what is being done or why; research programs are being dropped wholesale, and personnel in many laboratories is being sheared as much as 50 per cent.

• What may be perhaps a revolutionary new electrical method for producing steel directly from the raw materials, devised by Professor Martin Wiberg, of the Royal University of Technology, Stockholm, Sweden, has been in secret experimental operation for ten years at the Soderfors plant, and in commercial production for over a year. A WPB technician has been over to examine the procedure, but his official report has not been revealed.

• Deterioration of British labor in coal mines has been constant—output per man-shift is now 2090 lb., against a pre-war level of 2313 lb. Absenteeism today is 11.45 per cent, against a pre-war level of 6.80 per cent.

• And: Britain is planning to cut further an already very thin domestic coal consumption to make coal available to conquered areas in the Mediterranean.

• German propaganda has taken many curious shifts lately. At first "Nazi Bomber Drohen" (Nazi bombers threaten) was the slogan for a quick victory; this was replaced by the submarine menace; now, oddly enough, long range guns on the Channel are being played up—German radio says these guns will destroy the coastal area from Dover to Portsmouth and even play havoc in London.

• The Texas City tin smelter continues to operate considerably below contemplated capacity, due to the problems presented by low grade Bolivian ore. Imports of the ore likewise are under expectations.

• Germany has withdrawn the bulk of her submarines to equip them with batteries of anti-aircraft guns and with hangars for small fighter airplanes.

• Allied success against the submarine is being credited by both sides to the air cover in mid-ocean supplied by light carriers. However, sinkings have been so spectacular as to raise the suspicion that some new weapon or some greatly improved weapon has had a hand in the carnage.

• One West Coast shipyard is supposed to be importing 300 Mexicans, the first of such special deals with the Mexican Government outside of agricultural labor.

• Of about 4500 soldiers recently released for non-ferrous metal mining, only about 50 per cent chose to return to the mines. Mining company officials complain that those who did return hurt morale of other miners by wishing they were back in the Army.

• The War Frauds Unit has had nearly 3000 complaints in the past year, about 10 per cent leading to prosecution. Nine hundred cases are under investigation; 60 have been successfully prosecuted.

• Boeing's DPC Renton division, for sometime engaged in subassemblies, is expected to produce complete B-29s by Jan. 1.

• While the Army denies that a recent open hearth explosion was due to a loaded shell, none the less all mills and the scrap trade are now being warned repeatedly to be on the look-out for explosives in battlefield scrap.

• Wooden tires are being given serious trials in Sweden, with 200 trucks now outfitted. The tires are made up of a large number of small wooden blocks, fitted together to form the treads. They are supposed to be used on rear wheels only.

• Photographs of the Wilhelmshaven raid damage show whole sections of dockside buildings and equipment, hundreds of yards in length, lifted and thrown bodily into the water. In one case the convex dome of an oil storage tank was blasted concave at a distance of a quarter of a mile from the bomb crater.

• Curiously enough, at Cologne a number of factories seem to have survived without being completely flattened. Many factories shown in the photographs have roofs, although these roofs are frequently holed with signs of the ravages of fire beneath.

• Of 80,000 additional workers War Manpower Commission declares necessary to man defense industries in San Francisco Bay area, 700 must be secured before Sept. 1 to open Columbia's new steel foundry at nearby Pittsburg, Cal.

Mechanical Properties of Iron-

. . . Results of physical tests (tensile, yield, elongation and hardness) made on annealed specimens of a series of carbon-free iron-phosphorous alloys are shown herein.

PHOSPHORUS in iron and steel has been considered for a long time as a harmful ingredient, although some metallurgists have held that it can be considered a beneficial alloying agent. The British, particularly, always have considered phosphorus a harmful element primarily because of its effect on the impact characteristics of steel. The Americans, on the other hand, while fully aware of the impact influence of the element, have nevertheless recognized in it a certain usefulness because it raises the yield strength and improves the corrosion resistance of low carbon, low alloy steels.*

**See "Phosphorus in Mild and Low-Alloy Steels," by C. H. Lorig and D. E. Krause,* THE IRON AGE, *Oct. 19 and 26, 1939.*

The effect of phosphorus on steel has always been an interesting one and in the course of investigations at Westinghouse on the magnetic properties of some iron-phosphorus alloys, particularly relatively pure material, it was considered worthwhile to investigate some of the mechanical properties, and these are reported herein.

Reviews on the effect of phosphorus on irons and steels have been published; Gillett[1] has made a critical survey of this field while Jordon[2] has compiled a bibliography on the constitution of the Fe-P system.

[1] *H. W. Gillett, Metals and Alloys, 1935, 6, 280, 307.*
[2] *L. Jordon, A.S.M. Handbook, 1939, p. 394.*

A 6 kg. ingot of electrolytic iron and a series of four Fe-P alloys of the same size prepared from Armco ingot iron and ferro-phosphorus, were melted in an induction furnace and cast in a chill mold. On analysis the phosphorous alloys were found to contain 0.25, 0.46, 0.65 and 0.86 per cent phosphorus while the iron was found to contain 0.012 per cent phosphorus. A complete analysis is given in Table I. Despite the fact that the iron for the phosphorus series was deoxidized with 0.2 per cent aluminum, the electrolytic iron excepted, the 0.24 per cent phosphorus alloy blew violently in the mold; the 0.45 and 0.65 per cent phosphorus alloys blew slightly; and only the 0.86 per cent phosphorus alloy did not blow at all.

Ingots were forged at 900 deg. C. (1652 deg. F.) to 0.25 x 1.0 in., after which they were hot rolled at 900 deg. C. to 0.075 in. The surfaces of the materials were good; alloys con-

TABLE I

Analyses of Experimental Phosphorous Alloys

Ingot	P	Mn	Si	S	C**	Al
1*	0.012	00	00	0.007	0.003	0.08
2	0.24	0.043	0.01	0.016	0.005	0.12
3	0.46	0.045	0.01	0.016	0.026	0.19
4	0.65	0.040	0.01	0.020	0.012	....
5	0.86	.....	.....	.....	.....	.....

* Remelted electrolytic iron.
** Yensen method, American Electrochemical Society, 1920, 37, 227.

TABLE II

Physical Properties of the Experimental Alloys

Material	Annealed 1 Hour, 900° C. (1650° F.) in Dry H_2				Cold Rolled 65 Per Cent		
	Tensile Strength, Lb. Per Sq. In.	Tield Strength, Lb. Per Sq. In.	Elongation, Per Cent in 2 In.	Hardness,[c] DPH	Tensile Strength, Lb. Per Sq. In.	Elongation, Per Cent in 2 In.	Hardness, DPH
Pure iron 0.01% P	27,400	13,200[a]	29.8	72	69,200	2.0	178
0.24 P Alloy	49,980	28,450[b]	40.1	143	129,500	2.0	303
0.46 P Alloy	65,600	45,300[b]	27.8	183	125,800	2.5	317
0.65 P Alloy	55,070	46,800[b]	2.5	185	144,400	1.5	325

(a) Yield point on iron taken at "drop of beam."
(b) Yield point measured at 0.2 per cent permanent set from stress-strain curve.
(c) Diamond pyramid hardness (Vickers) for 5 kg. load.

Phosphorous Alloys

By JAMES K. STANLEY
Westinghouse Electric & Mfg. Co., East Pittsburgh

taining 0.45, 0.65 and 0.87 phosphorus had rough edges which had to be ground off prior to the cold rolling operation which consisted of rolling the strip on a two-high mill to 0.025 in. (about 65 per cent reduction). The pure iron, and the 0.24 and 0.45 per cent phosphorus alloys rolled very easily. The 0.65 per cent phosphorus alloy could be rolled if, in the beginning of the cold rolling, it were "broken down" with light reductions (1 to 2 per cent per pass), after which the reduction per pass could be increased, the material responding quite well to further rolling. The 0.87 per cent phosphorus alloy could not be cold rolled at all. From this cold rolling behavior it appears as if the practical limit for cold working purposes is about 0.5 per cent phosphorus.

Tensile test specimens were machined out of this 25 mil material; four to five specimens comprised a set.

The tensile strength and elongation of these alloys was determined on the annealed (1 hr. at 900 deg. C.), and cold rolled strip (cold rolled 65 per cent). These data are tabulated in Table II, and the properties for the annealed alloys are plotted in Fig. 1.

In the annealed alloys the tensile strength increases quite rapidly with increasing phosphorus up to about 0.46 per cent phosphorus and then decreases. The yield strength is almost parallel to the tensile strength as might be expected. The elongation of the alloys up to 0.46 phosphorus is surprisingly good, being as high as 40 per cent for the 0.24 per cent phosphorus alloys and 28 per cent for the 0.46 per cent phosphorus alloy. The stress-strain curves for these alloys are plotted in Fig. 2.

In the processing of these alloys, the cold working was stopped at a 65 per cent reduction and specimens were taken for physical tests. These results also are shown in Table II. It is quite evident that the phosphorus, even in small quantities, exerts a considerable work hardening effect, as is seen from the tensile strength of over 125,000 lb. per sq. in.

Hardness was determined on the alloys in the various states and is recorded in Table II. For the annealed specimens the hardness increases almost linearly and then tapers off. Specimens which were cold rolled 65 per cent have considerably greater hardness than the pure iron, but very small increases in hardness is shown with increasing phosphorus content.

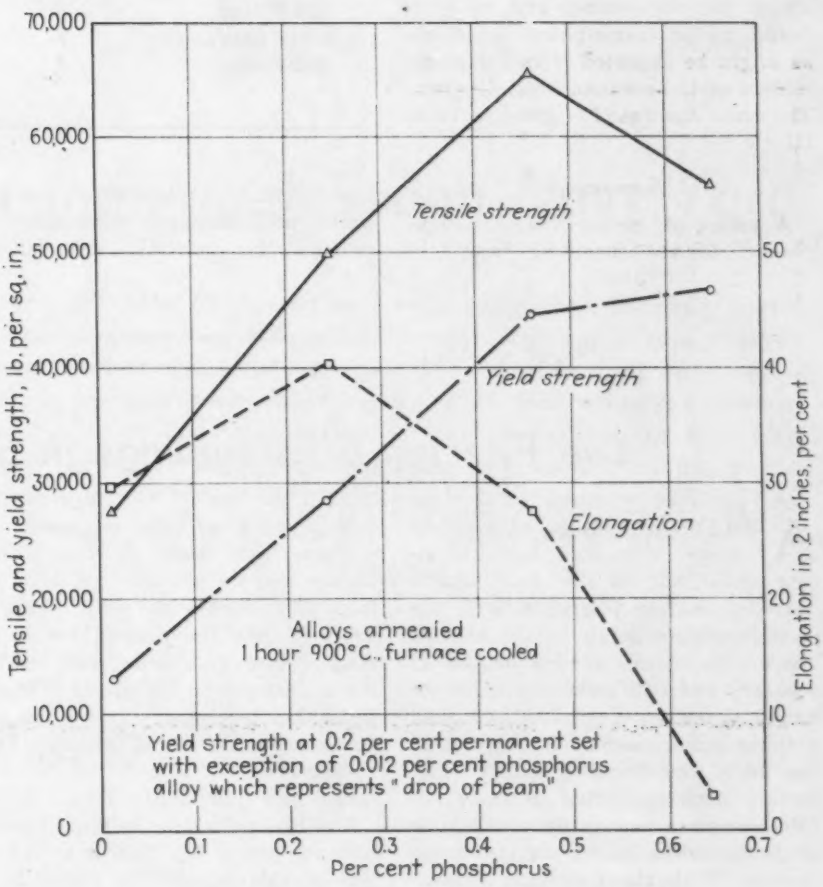


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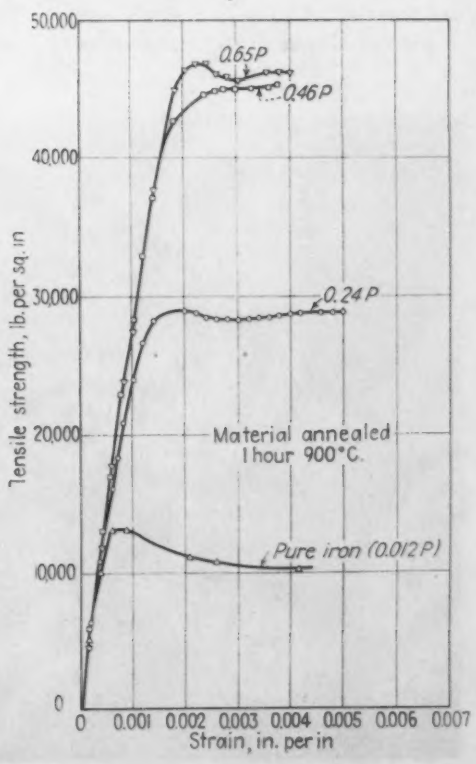
FIG. 1—Mechanical properties of a series of annealed phosphorous alloys.

RIGHT

FIG. 2 — Stress-strain curves of four carbon-free iron-phosphorous alloys.



These tests substantiate Gillett's statement[1] that for alloys of low carbon content and increasing phosphorus, well beyond the normal content, the tensile strength, yield strength, and hardness are raised with little loss in ductility.

All of the alloys were examined under the microscope, and all were found to be single-phase materials, as might be expected from the examination of the constitutional diagram. The grain size found is given in Table III.

TABLE III

Grain Size of Experimental Aloys

Sample	A.S.T.M. Grain Size
Pure iron	0
0.24 P Alloy	6
0.46 P Alloy	7
0.65 P Alloy	4

Summary

A series of carbon-free iron-phosphorous alloys containing from 0.12 to 0.86 per cent phosphorus was prepared and attempts were made to cold roll the material. Material containing phosphorus up to 0.46 per cent was readily cold rolled; material containing 0.65 per cent phosphorus could be rolled if care were exercised; and material containing 0.86 per cent phosphorus could not be cold rolled at all.

Physical tests (tensile strength, yield strength, elongation, and hardness) were made on the annealed alloys. The strength and yield values, as well as hardness, were found to increase linearly to 0.46 per cent phosphorus after which they leveled out; the elongation was also very good (30 per cent or better) for alloys up to 0.46 phosphorus but decreased rapidly after this concentration.

Die Piercing of Stampings in Small Lots

A SMALL percentage of stamped parts do require fairly accurate profile, but the size, location and finish of the die pierced hole is the most important detail on the finished blank. To obtain a high degree of accuracy and still make it possible to have 100 per cent flexibility as to tool changes with minimum initial cost of the tools, the Dayton Rogers Mfg. Co. of Minneapolis has recently developed and is now using a new type of punch press, known as automatic electric. With these piercing presses it is possible to change the hole size and location of holes in a given group of pierced blanks to any size and location required, with the minimum cost.

These hole sizes in the pierced blanks can be produced of any size from 0.015 to 1⅛ in., progressing by 0.001 in. and the presses are so arranged that hole sizes and location can be changed on one group of blanks to another without disturbing the production capacity of the presses. Each 15-ton press is completely self-contained and individually motor driven.

The ram on which the die is mounted is carried at the bottom or bolster side of the press. The punch is on the upper section and is stationary. The flywheel has an electric clutch with automatic releasing brake built into the base of the machine. Each machine is provided with its own working guard, and when it is necessary for the operator to change the tools, the guard trips automatically upon removal and throws the power switch of the individual press. Each machine is provided with a special cushion stripping mechanism carried in the head or on the punch side of the press. The automatic trip is so arranged that once the work is in correct point for operation, the machine automatically goes through the required working cycle, and then is locked out until the next piece is put in correct position, thus eliminating the hazard of requiring the operator to trip the press manually when the work is in correct position. In this way there is positive protection at the point of operation, bringing the hazard of punch press operation to a minimum. In case of current failure, the press automatically locks itself out.

These die piercing presses may be easily grouped together and can be used to an advantage where the work has to be passed from one press to another. Machines may be grouped in circles or horseshoe layout as illustrated, making it easy for the operator to move the work from one machine to the other.

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Sheet Metal Work

At the Puget Sound Navy Yard

By FRANK J. OLIVER
Technical Editor, THE IRON AGE

. . . From the point of view of variety of equipment, the sheet metal shop of this West Coast Yard has "everything" and is in a position to manufacture almost any conceivable object in light gage materials. In the first part of the article, after reviewing the general setup, some of the unusual operations performed on the drop hammer are described and illustrated. A variety of press and welding operations will be illustrated in a succeeding article. All illustrations are from official U. S. Navy photographs.

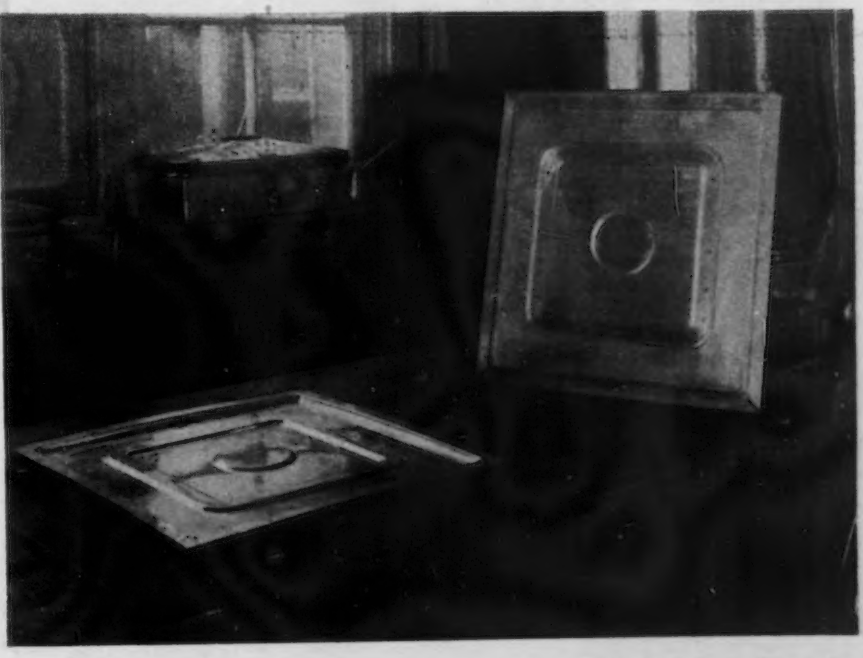
WHEN war was declared and the activity at the various Navy Yards was stepped up in tempo, the sheet metal shop at the Puget Sound Yard at Bremerton was in an excellent position to assume the additional burden because it was already equipped with as wide a variety of sheet metal machinery as any shop in the country. Since Pearl Harbor, additional machinery has been installed and the shop has gone on a three-shift basis so that output has multiplied manyfold. A description of equipment and operations carried on here is of interest inasmuch as it exemplifies all the best known techniques, including many that are ordinarily not found outside the aircraft industry and many that were originated there.

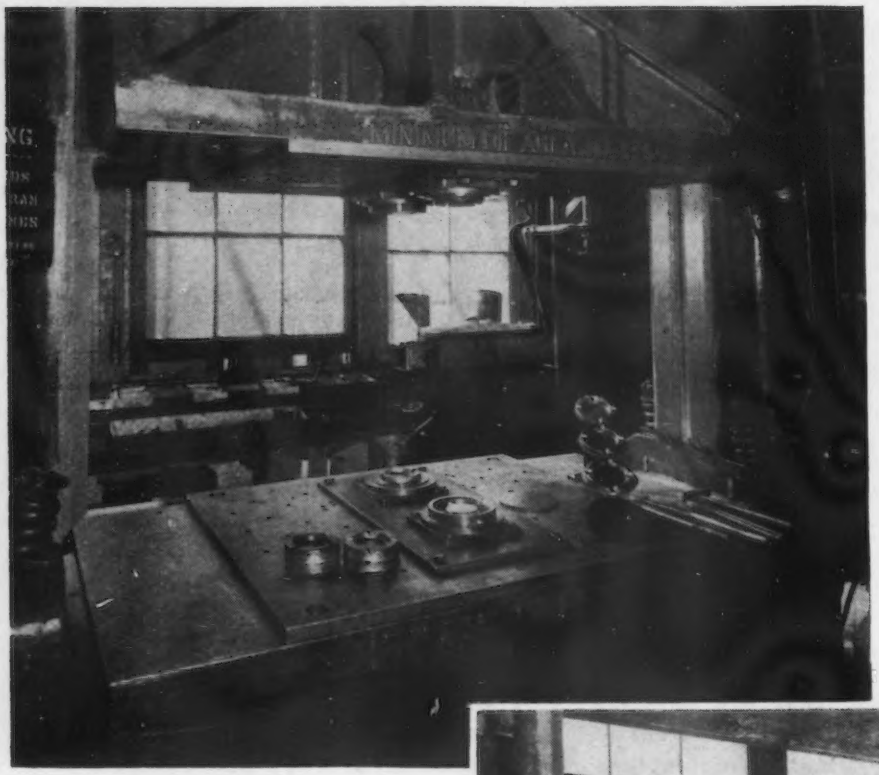
To give an idea of the extent of the operations, it can be said that approximately 2700 jobs are active at one time, ranging from simple objects requiring only layout pattern work and shearing, up to large fabricated products like galley tubs (big cooking pots) calling for a complicated sequence of operations and expensive die setups. About 30 new jobs are brought into the shop each day and are usually cleared through the master sheet metal worker's office before going to the layout room, which is literally up among the rafters. The necessity for additional machine space has crowded the drafting department into a third floor constructed just under the roof frames. Here paper templates are prepared for developed sections and galvanized steel templates are laid out for jobs of a more permanent nature. Punch press, drop hammer and hydropress dies are also designed here. In general, shop work is planned about three months ahead, based on estimated manhours required for various types of naval vessels coming into the yard for repair and modernization.

Training School

Directly connected with the sheet metal shop is a training school for civilian workers in the outfitting docks, the shop itself and enlisted repair crews stationed on the boats themselves. Over 700 persons have been trained in this school. Each trainee gets 4 hr. each week of instruction in the school shop on hand-operated equipment like brakes, shears, bending rolls, seamers and wiring machines, plus 2 hr. of classroom instruction on sheet metal practice. Layout work is taught in the local high school and each student is required to spend 4 hr. a week on his own time at this training. The remainder of the time, these students

FIG. 1—Transom locker doors are typical of the type of shallow draw work done on either the drop hammer, as shown, or on the hydropress. These doors are made of either aluminum or steel.





ABOVE

FIG. 2—Ash trays formed in Chambersburg Cecostamp drop hammer. Note forming dies, blanks and finished trays. The piece is formed in two shots. Trimming is a later operation.

are employed on regular shop jobs or the installation of fabricated sheet metal parts on the vessels. No women have yet gone through the shop school, although 44 girls have received or are receiving layout instruction at the Bremerton High School. They will be employed in the shop drafting room.

Practically all the machine forming is done on the ground floor and the lighter operations, including soldering, seaming, gas and arc welding and fabrication work are done on the second floor, which also houses machines like hand brakes and light shears.

The following list of the types of equipment found on the ground floor gives a good indication of the variety of equipment and the choice of methods available:

- 5 Cincinnati and Niagara power squaring shears
- 4 Cincinnati, Niagara and Dreis & Krump press brakes
- 6 Bending rolls, hand and power
- 3 Savage nibbling machines
- 1 Yoder power bumping hammer
- 1 Fruin spinning lathe
- 1 Lennox rotary power shear

ABOVE

FIG. 3—The largest piece formed on the drop hammer is the sunshade for 0.50 cal. ready service ammunition boxes. In the background may be seen a tool box, the covers for which are formed on the Cecostamp. (See Fig. 11.)

BELOW

FIG. 4—Welded steel dies employed for forming wide flanges on small boat fuel tanks used in Cecostamp drop hammer.

- 3 Band saws
- 1 Portable electric Unishear
- 2 Wiedemann hand turret punches
- 2 Rotex turret punches
- 2 Wiedemann power turret punches
- 1 Bliss eccentric press
- 1 Toledo No. 92D double crank press
- 1 H & W dieing machine
- 6 Niagara inclinable back punch presses (Size Nos. 1¼ to 3½)
- 9 Resistance welding machines

ABOVE

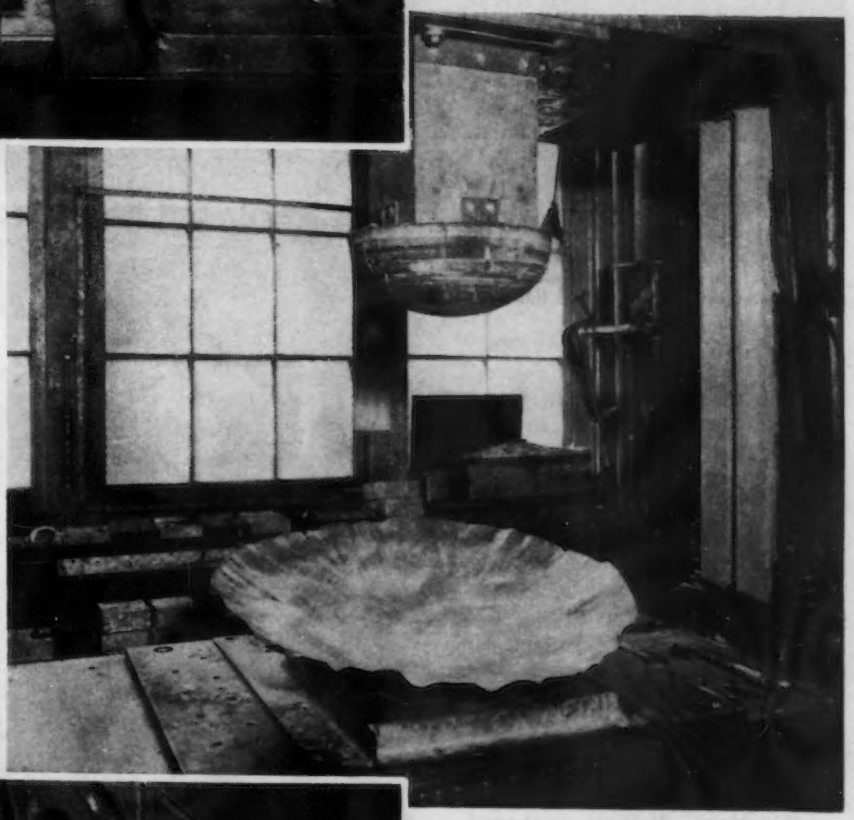
FIG. 5—Light rubber pad in its holder, right. This is used for blanking operations in either the drop hammer or the hydropress. Here it is shown employed for shearing funnel body blanks of all sizes.

1 HPM 425-ton hydraulic press, triple action
1 Chambersburg Cecostamp (air drop hammer)

Some of the most interesting jobs are performed on the two last named machines and in several instances the dies are interchangeable, that is, may be mounted on either the hydropress or drop hammer. Mess trays, for example, which have a shallow draw, are stamped in either of these units. So are transom locker doors, which are really embossed sea chest tops, Fig. 1. The draws in either case are so shallow that the operation is single action.

Drop Hammer Work

In the aircraft industry, where drop hammers are widely used, "soft" dies of zinc alloy in conjunction with lead or even plastic punches are generally employed. At Puget Sound, with few exceptions both halves of drop hammer dies are made of cast steel. The material is a chrome nickel alloy made in the electric furnace from remelted scrap. The dies require more labor for finishing, but stand up better than soft dies in service. Many of the hydropress dies are cast of the same material or are fabricated from structural shapes and plates welded together. Ash trays are formed in pairs in drop hammer dies of cast steel, Fig. 2. This is a relatively simple job. The largest part



ABOVE

FIG. 6—Use of Cecostamp as bumping hammer for rough forming of boiler head with rubber pad on platen and wood die above. This job was developed at Puget Sound and is believed to be a unique application.

BELOW

FIG. 7—Using Cecostamp as smoothing hammer with convex (lower) and concave (upper) steel dies. Application is smoothing sheet metal lagging heads for boilers.

ABOVE

FIG. 8—Steel die for making ventilation pipe elbows on the drop hammer. These jobs run into big production. For seam welding of elbow halves, see Part II of this article.

made on the hammer is the ammunition box sunshade shown in Fig. 3. The die for this job occupies practically the full platen area of the machine, which covers 46½ x 25½ in.

Simple flanging work is done on the Cecostamp, using boiler plate template dies welded to heavier steel base plates. Flanges for ventilation ducts are a good example. The flat rings from which they are formed are cut out on a nibbler or on a circular shear for the lighter gage material. For wide flanging of fuel tank ends, Fig. 4, more elaborate dies of welded steel construction are used.

Blanking is also done on the Cecostamp, using a 2-in. rubber pad of fairly high durometer reading on the hammer and boiler plate punches on the press bed. The same job of blanking can also be performed on the hydropress. In fact, in the aircraft industry, rubber pad blanking is invariably done on hydropresses. It is quite an innovation to use the hammer for this purpose. The pad used here measures 19 x 36 in. and in Fig. 5 it is shown mounted in its holder for use on either hammer or press.

BELOW

FIG. 10—Gang punching locker parts in the drop hammer, using an adjustable die. Note the use of wood blocks to limit the stroke of the moving platen.

ABOVE

FIG. 9—Simple form of stencil type holder used for stamping identification tags on the drop hammer. This method is used because a quick, forceful blow is required and because smaller crank presses do not stand up well under this type of service.

A typical blanking job on either press or hammer is shearing developed patterns or gores, which are later rolled up and seamed into elbows, liquid measures of truncated conical form, like pint, quart and gallon measures, familiar in the gasoline service station; also funnels.

Loose rubber pads are also used on the hammer for bumping work to straighten out wrinkles set up in single-action forming, or to form domes from the flat, Fig. 6. Here again, the rubber is fairly high durometer reading (not to be confused with so-called "hard rubber," as this

rubber is tough but still elastic). The punch member for this work is of hard wood and is dome shaped as is the lower cast steel anvil member. The operation is similar to work done on a power bumping hammer. Fig. 7 shows a similar application of the drop hammer as a bumper, using convex and concave steel dies for smoothing out a dome.

The biggest production job done on the drop hammer is the forming of ventilation duct elbow halves. These are used by the hundreds of thousands in the course of a year and range in size from 2½ to 9 in. pipe section, in steps of ½ in. Formerly, these elbows were made in gored sections, like the familiar stove pipe joint, and soldered or riveted. This conventional method is both slow and costly in terms of manhours of labor expended. By making the elbows in halves and then welding the flange material together, an average labor saving of $5 apiece is achieved. Before welding, the flange material is rough trimmed with a Unishear and finish trimmed on a circular shear.

Fig. 8 shows one of the smaller elbow dies on the Cecostamp. The elbow half is made in one shot on the hammer from black steel plate. The die material is cast steel as mentioned previously. About 400 to 500 elbows are made at one time, but much less could be run through, since the die setup time, particularly on the smaller dies, only amounts to a few minutes at the most. Water-tight elbows, as will be explained later, are made in the hydropress.

Several other unusual jobs are done on the drop hammer. One is stencilling identification tags for all the work that is handled in the shop. Stamping work of this kind is a modification of coining and is unusually tough on a crank type press. Hand work is too slow and the variety of tags does not warrant special marking machines. Type stamping makes an ideal job for a drop hammer. The type stamps are held in a special holder, Fig. 9, which is mounted on the lower platen. The tag material is usually hot rolled sheet steel scrap which is laid over the stamps and hit with a flat boiler plate punch in the hammer slide.

Still another unusual job done in the Cecostamp is gang punching operations, which would ordinarily be performed on a crank brake. This operation is shown in Fig. 10.

Other sheet metal parts formed on the drop hammer include the following parts for small boats:

FIG. 11—Metal tool box covers being formed in the drop hammer. Note particularly the dual controls whereby hammer is not released until both operators have signified all clear. Punch is made of a lead alloy.

Canopy corners
Vent cowls
Fuel tank heads (Fig. 4)
Engine cover lids
Vent hoods for engine covers
Louver panels for doors

Other miscellaneous items produced on the hammer are:

Metal lagging for evaporator heads
Tool box covers, all sizes
Tool box bottoms
Galley tub bottoms
Ventilation pipe hangers
Ventilation pipe gaskets
Fan impeller blades
Flanged radius ends of fume tight doors
Vibration dampeners
Portable lamp shades
Universal joint covers
Bucket bottoms
Card holders
Bridge window frames
Deflection molding for bulkheads
40-mm. shell carriers

The tool box cover job, Fig. 11, has some unusual features. It represents a fairly deep draw for single action work and this is one of the few dies made of soft metal. The lower die is held in a steel retainer cut from plate. Upper die is made of an alloy of lead and antimony.

Flanged radius ends of fume tight doors are restruck in the drop hammer in a die which holds the door at an angle as seen in Fig. 12. This die is made from welded steel plate. It is unusual in that the workpiece must be partly supported by hand while being struck.

(To be concluded)

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FIG. 12—A typical welded plate die, in this case used for forming rounded corners of pressed panel doors in the drop hammer.

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Intensifying of NE 9422 S

THE effects of the addition of Grainal on the Jominy hardenability tensile properties, and impact strength of NE 9422 steel are shown in the accompanying chart and table. The nominal composition of the Grainal used in this work was 20 per cent titanium, 13 per cent aluminum, 4 per cent zirconium, 8 per cent manganese and 0.05 per cent boron.

Many customers designate the non-vanadium bearing type of Grainal by the experimental number originally assigned to it. As a means to simplify the identity of same, the Vanadium Corp. of America decided to designate this grade hereafter as Grainal No. 79. The Vanadium bearing types of Grainal will be designated as heretofore, namely, Vanadium Grainal No. 1 and Vanadium Grainal No. 6.

TABLE I

Test Data for 1 in. Round Bars of NE9422 and NE94T22 (Grainal-treated) Steel after Various Heat Treatments

	C	Mn	Si	S	P	Cr	Ni	Mo	A.S.T.M. Grain Size
NE 9422	0.25	1.03	0.47	0.025	0.012	0.28	0.28	0.13	7–8
NE 94T22 Grainal	0.25	1.03	0.48	0.021	0.011	0.28	0.30	0.16	7

Type	Yield Point	Tensile Strength	Elong.	R. A.	Yield Ratio	B.H.N.	Izod	"P"* Value
1750 Deg. F. (½)N. + Pseudo Carb. 1700 Deg. (8 hr.) O.Q. from Pot + 325 Deg. (1) Air								
NE 9422	94,400	157,100	14.0	31.2	0.60	316	20.8	69
NE 94T22 Grainal	201,300	227,800	13.0	48.4	0.88	440	34.2	104
1750 Deg. F. (½)N. + Pseudo Carb. 1700 Deg. (23 hr.) O.Q. from Pot + 350 Deg. (1) Air								
NE 9422	94,900	151,600	15.0	29.8	0.63	318	21.2	66
NE 94T22 Grainal	189,550	220,900	12.5	48.6	0.86	441	33.7	103
1750 Deg. F. (½)N. + Pseudo Carb. 1725 Deg. (8 hr.) O.Q. from Pot								
NE 9422	98,150	162,350	13.5	29.5	0.69	342	19	68
NE 94T22 Grainal	189,050	225,900	11.5	40.3	0.84	438	33	94
1750 Deg. F. (½)N. + Pseudo Carb. 1725 Deg. (8 hr.) O.Q. from Pot + 350 Deg. (1) Air								
NE 9422	111,900	163,100	13.5	29.5	0.69	342	19	68
NE 94T22 Grainal	186,050	223,900	12.5	48.0	0.83	437	34.3	102
1750 Deg. F. (½)N. + Pseudo Carb. 1725 Deg. (8 hr.) O.Q. from Pot + 1500 Deg. (½) O.Q. + 350 Deg. (1) Air								
NE 9422	102,900	155,600	15.5	36.0	0.66	322	19.3	74
NE 94T22 Grainal	199,800	227,000	13.5	51.7	0.88	446	44.5	107

* The "P" Value is calculated from the formula $P = \frac{TS + 6000RA}{5000}$ and serves as a toughness-strength factor.

TABLE III

Brinell Hardness of Grainal-treated Steels Quenched in Oil and in Water

Oil		Quenching Temperature, Deg. F.	Water	
NE 9422	NE 94T22 Grainal		NE 9422	NE 94T22 Grainal
179	207	1300	212	209
302	300	1400	363	363
311	311	1425	388	383
302	331	1450	415	415
302	420	1500	477	461
282	415	1550	477	477
311	417	1600	477	477
306	415	1650	461	477
277	415	1700	477	461
307	415	1750	477	461
321	409	1800	477	448
311	409	1900	461	461

The samples used in these tests represent both untreated and Grainal-treated (4 lb. per gross ton) ingots from the same commercial basic open hearth heat.

Specifications for steels of this general class, carbon and very low alloy steels with intensifying additions, have recently been published as Ordnance Dept., U. S. Army Tentative Specification AXS 930 (March 30, 1943). The steel described here more than meets the requirements of Grade WD 94T20. Steel of this type, Grainal-treated, is already being specified for a considerable number of parts.

Other articles on intensifying and addition agents containing boron appeared in THE IRON AGE, *issues of Nov. 19, 1942; Feb. 4 and March 25, 1943.*

The effect of the Grainal addition in increasing the capacity for hardening of this base steel composition is quite apparent from the Jominy curves. While both steels actually come up to a Rockwell C hardness of 50 on the *end* of the Jominy specimen. this value was not attained along the side; therefore, for these low carbon steels, comparison is drawn customarily on the basis of a Rockwell C hardness of 40, which was obtained 0.15 in. from the quenched end of the specimen for the untreated steel, while 0.63 in. is the corresponding position in the Grainal-treated steel.

The Jominy hardenability curves are plotted on a form differing somewhat from the usual ASTM chart in that the *approximate*, expected hardness at the center of round bars of different sizes, when quenched in either oil or water, can be read directly from the Jominy curve.

The effective of the Grainal treatment on the tensile and Izod impact properties of the two steels is shown for various heat treatments in Tables I and II. At 0.25 per cent carbon,

2 Steel

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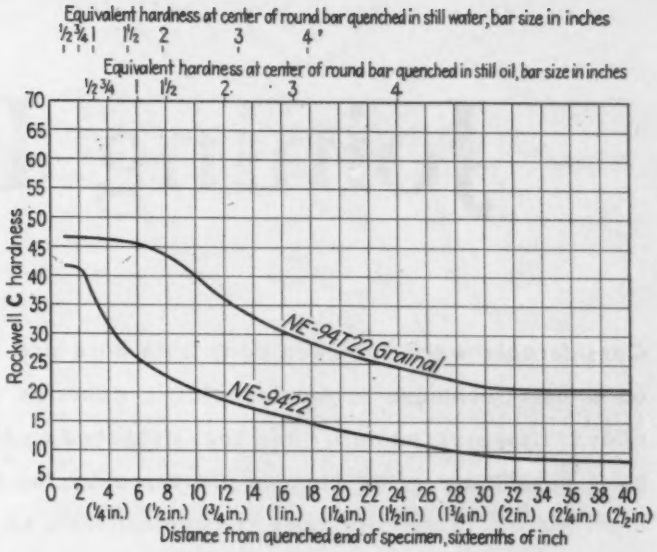
. . . This is the second of a series of Vanadium Corp. of America investigations of intensifying addition effects on NE steels. The first article, which explored the properties of intensified NE 9440, appeared in THE IRON AGE, July 1, 1943.


Equivalent hardness at center of round bar quenched in still water, bar size in inches
½ ¾ 1 1½ 2 3 4
Equivalent hardness at center of round bar quenched in still oil, bar size in inches
½ ¾ 1 1½ 2 3 4
Rockwell C hardness
70 65 60 55 50 45 40 35 30 25 20 15 10 5
NE-94T22 Grainal
NE-9422
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40
(¼in.) (½in.) (¾in.) (1in.) (1¼in.) (1½in.) (1¾in.) (2in.) (2¼in.) (2½in.)
Distance from quenched end of specimen, sixteenths of inch

JOMINY hardenability curves for NE 9422 and NE 94T22 (Grainal-treated) steels, quenched at 1550 deg. F.

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the chemistry of the steel is on the hard side for some carburizing applications; nevertheless, Table I covers tests representative of various pseudo carburizing practices which may serve as a guide. On Table II both normal and high quenching temperatures for both water and oil are indicated.

Values for the tensile test are the averages of the results from two test bars. The Izod values are the averages of four tests, two notches per test bar.

It should be observed in the case of steel of this particular composition that a contribution by Grainal to hardenability is such that there is obtained in a comparison of oil quenched small bars a stimulaneous increase in those properties representing useful strength and those representing ductility and toughness. In the case of water quenching, the strength properties alter little at the low tempering temperatures but ductility and toughness are simultaneously increased when this quenching medium is used. With increased tempering temperature the rate of fall of hardness is less than in the untreated steel, thus affording over a very wide range of heat treatment a substantial improvement in all properties involved in considerations of utility.

Table III shows the surface hardnesses (Brinell 3000 kg.) on 1-in. rounds, either oil or water quenched from various temperatures.

For the as-quenched condition, the Grainal-treated steel shows definitely more effective hardening in oil than the base steel, thus confirming the other physical test results. Water quenching brings both steels into the same hardness classification, but reference to the other physical property values in Table II shows the Grainal steel to have superior qualities after treatment in both quenching media.

TABLE II

Test Data for NE9422 and NE94T22 (Grainal-treated) Steel

(As a preliminary treatment, the specimens for the 1575 deg. F. quench were initially normalized from 1700 deg. F. in 1-in. rounds. For the 1700 deg. F. quench, the initial normalizing temperature was 1750 deg. F. in 1-in. rounds. For the 500 deg. F. tempering treatment, the specimens were quenched in preliminarily machined size; all others were hardened in 1-in. rounds.)

	C	Mn	Si	S	P	Cr	Ni	Mo	A.S.T.M. Grain Size
NE 9422	0.25	1.03	0.47	0.025	0.012	0.28	0.28	0.13	7–8
NE 94T22 Grainal	0.25	1.03	0.48	0.021	0.011	0.28	0.30	0.16	7

Type	Quench, Deg. F.	Yield Point	Tensile Strength	Elong.	R.A.	Yield Ratio	B.H.N.	Izod	"P"* Value
500 Deg. F. Temper									
NE 9422	1575 Oil	155,600	199,050	11.8	43.1	0.79	378	18.0	92
	1700 Oil	145,350	177,075	12.0	41.4	0.82	346	16.0	85
NE 94T22 Grainal	1575 Oil	187,800	225,050	13.8	57.0	0.84	439	46.5	113
	1700 Oil	178,300	223,050	13.0	56.0	0.80	442	39.0	112
NE 9422	1575 Water	189,300	221,800	12.5	52.4	0.85	426	28.2	107
	1700 Water	177,750	219,350	11.8	50.0	0.81	427	24.5	104
NE 94T22 Grainal	1575 Water	183,550	215,800	14.0	60.0	0.85	435	36.7	115
	1700 Water	174,300	213,550	13.5	58.6	0.82	420	39.2	113
900 Deg. F. Temper									
NE 9422	1575 Oil	98,300	121,250	20.5	64.5	0.81	256	96.5	102
	1700 Oil	96,500	119,650	20.5	64.1	0.81	249	95.7	101
NE 94T22 Grainal	1575 Oil	144,850	151,600	17.5	65.5	0.96	320	81.2	109
	1700 Oil	141,350	150,000	18.0	64.9	0.94	315	81.5	108
NE 9422	1575 Water	120,650	137,350	18.0	63.9	0.88	287	93.0	104
	1700 Water	119,650	137,500	18.3	63.4	0.87	294	88.7	104
NE 94T22 Grainal	1575 Water	140,100	147,200	18.0	66.3	0.95	309	83.0	109
	1700 Water	137,000	147,200	17.0	66.2	0.93	309	92.2	109
1200 Deg. F. Temper									
NE 9422	1575 Oil	78,900	94,900	27.5	73.0	0.83	197	120+	107
	1700 Oil	75,800	94,400	27.0	73.0	0.81	188	120+	106
NE 94T22 Grainal	1575 Oil	97,400	107,900	24.3	71.9	0.91	227	120+	108
	1700 Oil	99,900	110,900	23.3	71.7	0.90	235	120+	108
NE 9422	1575 Water	86,050	101,150	26.3	72.8	0.85	210	120+	108
	1700 Water	82,900	100,500	25.5	72.9	0.83	207	120+	108
NE 94T22 Grainal	1575 Water	98,150	106,800	23.8	71.8	0.92	229	120+	108
	1700 Water	96,300	108,300	22.8	71.5	0.89	228	115.2	107

* The "P" Value is calculated from the formula $P = \frac{TS + 6000RA}{5000}$ and serves as a toughness-strength factor.

Joining Light Alloys b

Considerable work has been done both here and in Great Britain on a new technique employing plastic adhesive for joining light alloys. However, no data have been published on this development. Brief details are given here as presented by the British magazine Light Metals. Results of some mechanical tests on duralumin sheet of various gages are included.

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THE use of synthetic resin adhesives provides a method of bonding light alloys to light alloys and steel to steel with a strength exceeding, under certain conditions, that of riveting. The process is also capable of giving strong joints between metal and wood, a constructional device of rapidly growing importance in many spheres of interest, both in military and in non-military engineering practice.

This wide extension in the field of resin bonding opens up new possibilities in the sphere of aircraft construction and introduces further valuable assembly possibilities to the engineering and industrial designer. The development of the process may prove to be as significant as the introduction of the resin adhesives generally, which within recent years have revolutionized the plywood industry.

Basically, the process is a method of resin-bonding applied by a technique involving accurate control of variables, but adaptable to the nature of the surfaces to be joined and to the character of the structure to be assembled.

It enables light alloys and steel to be cemented together or to wood without stress concentrations, to give joints which are areodynamically smooth, gasoline tight and in some instances stronger than comparable riveted joints. It also gives strong joints between metal and wood, and is essentially economical and lends itself to modern production methods.

The synthetic resin adhesives used are unaffected by water, oil, or gasoline. The process works best with trivalent metals, such as aluminum (duralumin), chromium and iron or steel; it gives less satisfactory joints with brass, tin or zinc. The resin bond is mildly thermoplastic and loses strength at temperatures above 212 deg. F. The loss of strength is, however, regained on subsequent cooling provided that the joint has not been subject to undue strain while in the heated state.

The softening temperature referred to is sufficiently high for aircraft use where, by the elimination of riveting practice with its attendant formation of broken surfaces, the method provides distinct possibilities.

The process gives strong joints between metal and wood, and meets design requirements arising out of existing trends in aircraft construction. It solves, for example, the troublesome problem of attaching steel fittings to the root ends of wooden spars.

Other uses are found in the local reinforcement of wood where concentrated loads have to be applied to a structure. In such cases it is often convenient to cement the metal to a plywood facing by this system, and then to cement the plywood-metal component to the aircraft structure with a cold-setting adhesive such as

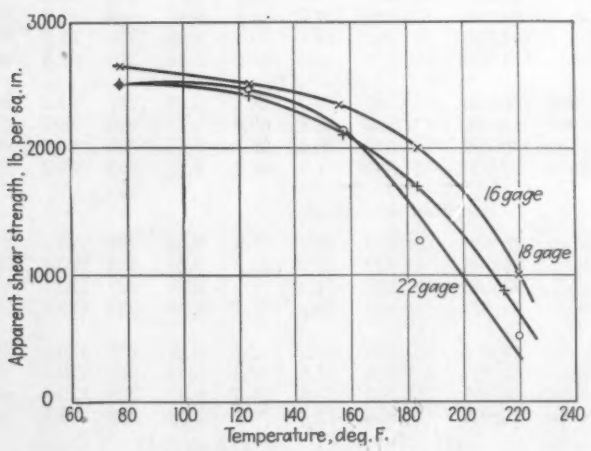


FIG. 1—Details and curves of shear test on lap joints in Alclad, 1 in. wide with ½-in. overlap. Joint was tested in 22 gage, 18 gage, and 16 gage thickness material, at temperatures from 68 to 230 deg. F.

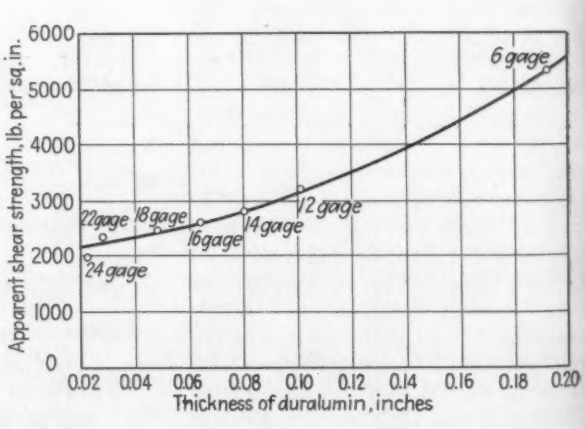
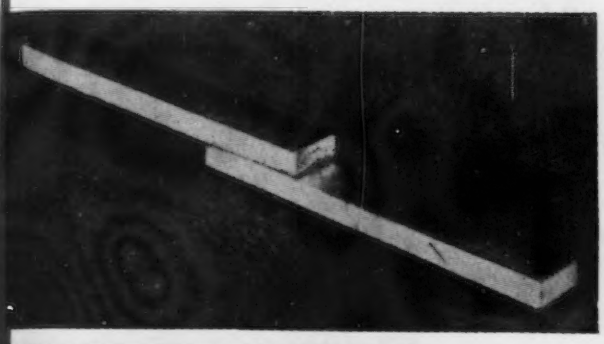


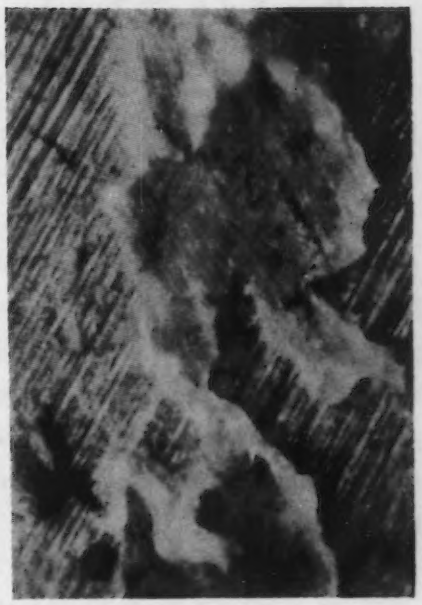
FIG. 2—Curve showing effect of thickness of material joined on apparent shear strength of joint. Thicker material gives a joint of increased strength.

ys by Plastic Adhesives



RIGHT

FIG. 4—An enlarged view of an adhesion surface of a Duralumin joint. The rupture has taken place at the plastic surface; no tearing of the Duralumin surface appears to have occurred. The roughened surface shown is not essential to good adhesion.



LEFT

FIG. 3—Picture at the top shows lap-joint test piece made with two strips of Duralumin 0.2 in. thick, 0.45 in. wide, with a lap of 0.9 in. Picture at the bottom shows the two units of the joint after breaking in shear.

Aerolite 300 with Hardener GMB or GPB. (Aero Research Ltd.)

Fig. 1 shows the results of tests on simple Alclad lap joints 1 in. wide, with ½-in. over-lap of 22 gage, 18 gage and 16 gage thickness, pulled at various temperatures. The joints were encased in an electrically heated oven and pulled in an Amsler 1,000 to 10,000 lb. machine. Temperatures were measured by a thermocouple attached to the specimens under test.

The strength increases somewhat with thickness of the strip, because, when pulled, such a joint is subjected to bending as well as shearing stresses; the greater stiffness of the thicker gage strips reduces the bending and causes the load to approximate more and more to pure shear. Thus (see Fig. 2) when 6 gage strip is used the apparent shear stress rises to 5300 lb. per sq. in. at room temperature.

It will be seen that with the gages commonly used in aircraft, the failing stress exceeds 2000 lb. per sq. in. at temperatures up to 158 deg. F. Resin-bonded joints do not become brittle at temperatures below freezing point.

Refrigeration of Coolant Oils Aids Production

A PRACTICAL and economical method of chilling the coolant oils during high speed surface grinding is being employed by the McCorsky Tool Corp. of Meadville, Pa., manufacturers of machine tools. Chilling the coolant oil to a constant temperature results in saving of time, skilled labor and war-scarce oil which ofttimes can be re-used. The life of the machines is prolonged.

This refrigerating system, installed by the Apfel Engineering Co., is designed to maintain a constant temperature of 60 deg. F. during the whole period of grinding. It utilizes a York self-contained cold well water cooler.

Prior to its installation the McCorsky Company, which uses two Thompson surface grinders, found that the coolant oil would rise from 80 to approximately 150 deg. within 1 to 2 hr. making it necessary to suspend operations.

Plastics and Plasticity—IV

By E. V. CRANE
Chief, Development Engineering Department, E. W. Bliss Co., Brooklyn

Press equipment, molds and dies for compression molding of synthetic resins are discussed in the fourth part of the article by Mr. Crane. Some of the more unusual methods described include transfer molding of the thermosetting plastics and screen molding of organic fibers mixed with synthetic resins. Paper compounded with synthetic resins is formable as a sheet plastic and the various techniques are described by the author. In the fifth and concluding part of the article, the author will continue with a discussion of the principles of forming resin bonded plywood and other plastic laminates.

SYNTHETIC resins alone in some cases, or with oily plasticizers and organic, ceramic or mineral fillers, discussed in the second article of this series, are widely compression molded. This process is, of course, the predecessor to injection molding, Fig. 19, which has adapted the same general principles to automatic operation with substantial advantage in time cycle, heat transfer efficiency and control. Distinctions between behaviors of thermoplastics and thermosetting mixtures were drawn in earlier articles and in discussing injection molding. Most powders if handled with sufficient care, can be measured from hoppers by volume. Mixtures containing macerated bits of cloth (for high impact resistance) and some other fillers complicate flow sufficiently to require hand weighing of individual charges. In small presses or rotary automatic machines, it is economical to use preforms or briquettes compressed to pellet or intermediate shape suitable to the die. Thermosetting preforms may be preheated on hot plates or (for greater internal uniformity and speed) by high frequency oscillator, before placing in the die. For high impact strength, preforms may take the shape of phenolic impregnated paper or fabric as in the case of the parts shown in Fig. 24. These parts were produced in regular compression molding dies from creped coil stock carrying up to 55 per cent of resin. The mass flowed to fill sharp outlines from preforms wound to suit.

Copyright, 1943, by E. V. Crane.

Problem of Trapped Gases

Trapped Gasses, as flaw producers, are even more of a problem in working with powders than is the case with casting methods. Proper size and uniformity of granules for mobility leaves considerable intermediate space for air which must be eliminated in compacting the mass. Moisture picked up from the air by wood flour or other thirsty constituents, goes into steam as the heat penetrates. Volatile constituents of unsuitable plasticizers must also be eliminated. Unless gassing is eliminated or porous mold materials can be used (e.g. sand, plaster, powder metals), suitable venting must be worked out in die casting or injection molding; in compression molding, a "breathing" period must be allowed by partially reopening the die after the initial squeeze and warming up. Preforming or pelleting eliminates much of the trapped air in some processes. Proper moisture elimination and protection reduces production of steam. Some successful molders find the breathing period unnecessary with suitable material control.

Material selection and control emphasizes once more the vital role of the chemist in this century's expansion of engineering materials. Development of organic "plastics," like ceramics and even metals, made an initial headway on relatively cheap natural sources such as pine resins, hide glues, lignin, casein, etc. Complex variety of constitution and impurities made reactions unreliable and difficult to control, contributing to the "finicky" reputation of the process. Industrial by-products which offered cheap sources of chemically more reliable synthetic resin constituents have contributed to more successful general application of plastic molding. Increasing demand makes practical the development of more independent sources of reliable synthetic materials so that the industry may stand on its own feet.

Fig. 25 is a semi-automatic compression molding press. Three electric time adjustments are provided at the left to control successively (a) the preliminary cure to presqueeze, heat throughout and vaporize gaseous constitutents, (b) the gassing period, partially opening the die for escape of gasses, (c) the final cure to maintain suitable heat for thorough chemical combination and chain polymerization of thermosetting binders, or for stress relieving to shape and partial cooling of welded thermoplastic powders. For heat economy, thermoplastic filled molds are sometimes transferred from a hot plate press to a cold plate press for a final squeeze.

The press shown has provision for adjustable top and bottom knockouts, although hand knockouts on the bench and hand control of cycle may be used for smaller lots. The unit shown has its own oil tank, motor and pumping unit for fast, flexible operation and pressure control. Many earlier systems use a central pumping and accumulator unit, employing water on account of the volume used and leakage experienced. Two or three supply lines and accumulators, at different predetermined pressures, combine with return lines and steam lines to link the press groups, in what one large operator described as a pipe fitters paradise. Such systems, like line shafting, offered certain initial economies at the probable expense of flexibility and maintenance.

Mold Types

Molds or dies for compression molding are well classified in the Tenite molding handbook[17] as positive, semi-positive and flash types. A positive mold fully confines the material, requiring that the charge be weighed with especial care. The more common semi-positive type, Fig. 26, partially confines the material, allowing for the overflow of a slightly excessive charge. The flash type mold, like a drop forging die, confines the material only by reason of the thinness of the flash squeezed out as the two halves close. It is best adapted to large areas, thin sections and to preforms or blanks prepared from extruded or impregnated sheet materials. A modification of the semi-positive construction permits the grouping of several small molds so that they may be filled from a common charge, leaving a common flash from which they may be trimmed in an inclinable punch press.

Transfer Molding

Transfer molding, performed in compression molding presses, anticipated injection molding by separating the plasticizing action in an auxiliary chamber above the mold. The four part set-up, Fig. 27, includes a simple cylindrical plunger and pot containing the weighed charge and set on top of and communicating through tapered sprue holes with the two part mold which is usually flash type. The pot and charge may be preheated, and in the case of thermoplastics, may extrude into a cool or cooled mold. The pot and plunger may be used repeatedly with molds requiring more or less similar charges.

Heating or cooling (when it is needed) is usually accomplished in hand and semi-automatic molding by running steam (under sufficient pressure for the temperature required) or water through drilled plates on the

FIG. 24—Compression molded thermosetting parts, in this case using impregnated creped paper and fabric coils as preforms. Courtesy Cincinnati Industries, Inc.

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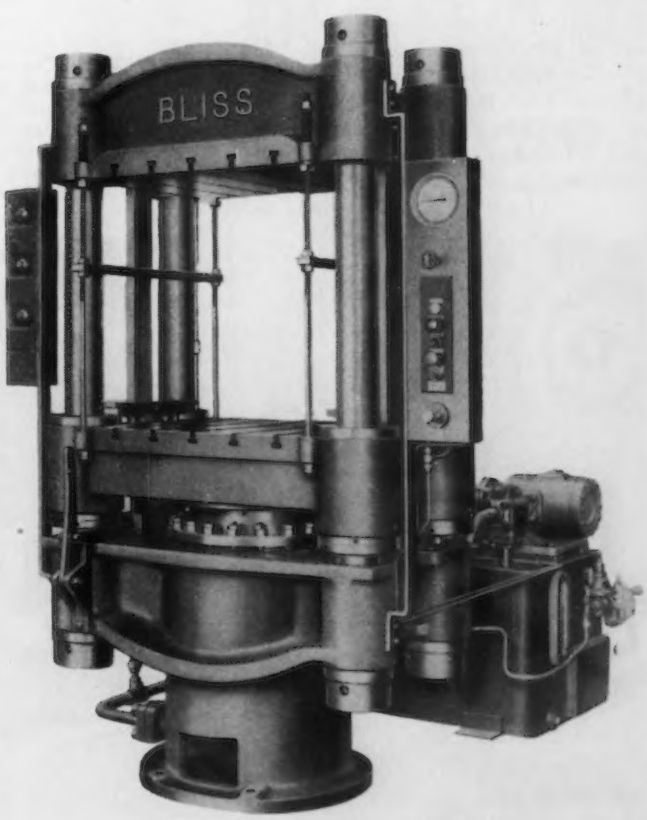

FIG. 25 — Compression molding press, semi-automatic having adjustable preheat, gassing and final cure timers, with individual high speed pump unit and controls for flexibility in pressure control and operation.

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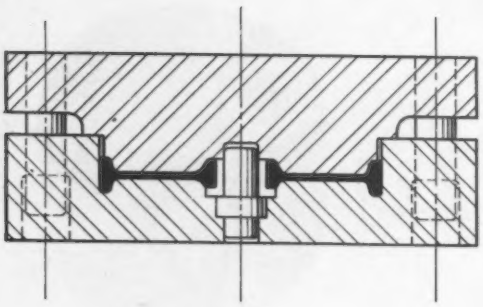
[17] *Mold designs vary more with preference than principle, but useful data and examples are to be found in "Tenite Molding," Tennessee Eastman Corp., Kingsport, Tenn.; "Designing Molded Plastic Parts," General Electric Co., Pittsfield, Mass.; "Plaskon Hand Book," Plaskon Co., Toledo; "Plastics in Engineering," J. Delmonte, 1942, Penton Publishing Co., Cleveland, and other publications.*



LEFT

FIG. 26 — Semi-positive compression mold with insert, knock-out, slight over-flow relief and guide pins.

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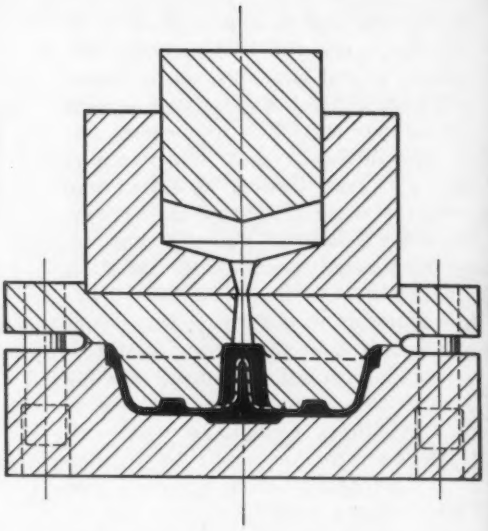

RIGHT

FIG. 27—A flash mold arranged for use with a transfer molding pot in which the powder charge is plasticized. Note web taper, corner radii and reasonably uniform sections of desirable part design.

press. A thin film of air retards heat transfer so that surface contacts should be good and joints closely made. Excessive heat or insufficient time for thorough heat penetration often results in imperfect molded parts. If dies are drilled for alternate heating and cooling, it should be noted that heat is delivered more quickly from condensing steam than it can be removed by water so that passages should be ample to suit cooling. Shrinkage allowances, venting, knock-outs, core inserts and provision for anchoring metal inserts are much the same as for injection molding.

Screen Molding

Screen molding tried experimentally for large area plastic articles, borrows its preparatory technique from paper mill and papier mache methods. In the latter, wood pulp is floated in about ten parts of water and distributed over or in a screen or porous mold with the aid of suction for uniformity of distribution. After removal of the bulk of the moisture, the shape is separated from the mold with the aid of air pressure and dried. For plastics application, the pulp or other organic fiber is mixed with synthetic resin, and the screen process preform is dried and transferred to hot press dies or molds for pressure at curing. Alternative to this is the basically similar method of producing plain or creped resin impregnated papers and fabrics, which may be cured to shape as illustrated later.

Sheets, Strips and Strands

For possibly the most important groups of mass produced articles, casting and molding are merely intermediate steps in the production of relative thin section sheets, coiled strips, rods and wound strands. These forms of material may be used as such but most go on to varied steps in further fabrication. Methods of fabrication from sheets and strips are of primary interest here, but close interrelation makes brief consideration of strand production worthwhile.

Tungsten powder, first pressed to close association, next heated in hydrogen well above recrystallization temperatures, then swaged into more compact association, reannealed, reworked now by wire drawing, reannealed, redrawn, etc., finally reaches a fine wire filament with tensile strength up to 590,000 lb. per sq. in. Low carbon steel wire, cast in a billet, rolled hot, rolled cold, annealed and cold drawn with intermediate anneals achieves a strength almost half as great. Vinyledene chloride powder extruded at temperatures well up in its recrystallization range and subject to stretching and working strain as it cools (Figs. 11 and 12) reaches a tensile strength of 30 to 60,000 lb. per sq. in. Nylon forced through a

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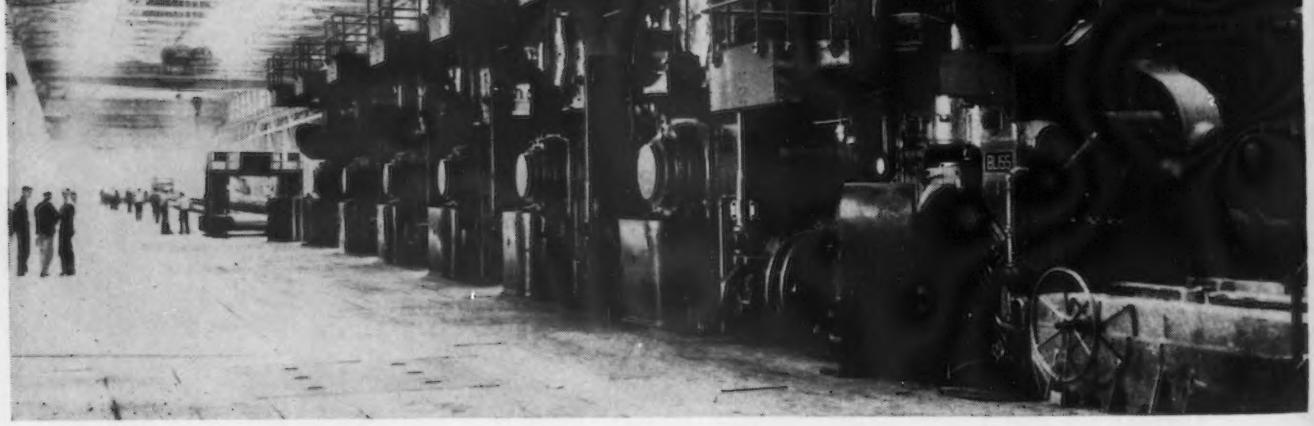
FIG. 28—This very fast Bliss progressive hot mill and similarly well developed paper mills point the trend for formable non-metallic thermosetting and thermoplastic materials (synthetic woods, etc.).



small die orifice into a solidifying bath and wound under high tension to achieve similar oriented polymer chain results, has exceptional strength (40-60,000 lb. per sq. in.) and durability. Glass, representing the ceramics, is drawn from molten form to fine threads and possibly "annealed." These typical strands of widely differing materials proceed to further fabrication by forming, winding, weaving, etc., to take advantage of their distinctive qualities. Somewhat allied extrusion and drawing and drawbench methods are used in producing rods, tubes and special sections from the various synthetic materials.

Sheet and coil forms of the metals have enjoyed substantial advantage over directly cast or molded forms in certain broad fields of application, and a variety of the non-metallic materials are following along similar lines. Especially is this so in fields in which the purpose is served by a material which is quite thin in proportion to the area of the part, and in which the non-uniformities of section, characterizing many directly cast or molded parts, either are not necessary or may be rearranged or added to favor the mass production economies of stamping or forming from sheet. This sheet or coil form has been made economical in turn by development of fast, large volume mills whether for metal, paper, cloth or the formable and curable mixtures.

Steel, mass produced for stamping and forming, suggests the trend for thin plastics. Cast into billets weighing up to ten tons and more, steel may be rolled hot (thermoplastic state) through high speed progressive mill stands, Fig. 28, then pickled washed and dried progressively, then cold rolled through fast progressive mills, which are electrically synchronized, then bright annealed in a reducing atmosphere and finally passed through a finishing mill stand for work temper and size. This process is subject to wide variation in practice to suit the output but the millions upon millions invested in rolling mills are responsible for remarkably low price per pound of the metals, and similarly of the papers and fabrics now available.

Paper a "Plastic"

Paper is the mass production antecedent of the molded "plastics," and is surging forward as a formable plastic when compounded with synthetic resins. Like the molded mixtures it combines a natural polymer fibre filler (usually wood pulp), with an adhesive binder or two, coloring or bleaching matter, and a plasticizer (usually moisture). Breaking up, cleansing and mixing of constituents precedes distribution on screens or screen rolls and subsequent hot rolling with possible intermediate dipping to add coatings, etc. Obviously papers are as varied in composition as the plastics and may include most of the same constituents. Similarly, the mills vary from extremely fast high volume news print mills to jobbing and specialty mills for quality papers, wall boards, cardboard, uncured thermosetting resin bearing sheet, cured fibers, etc.

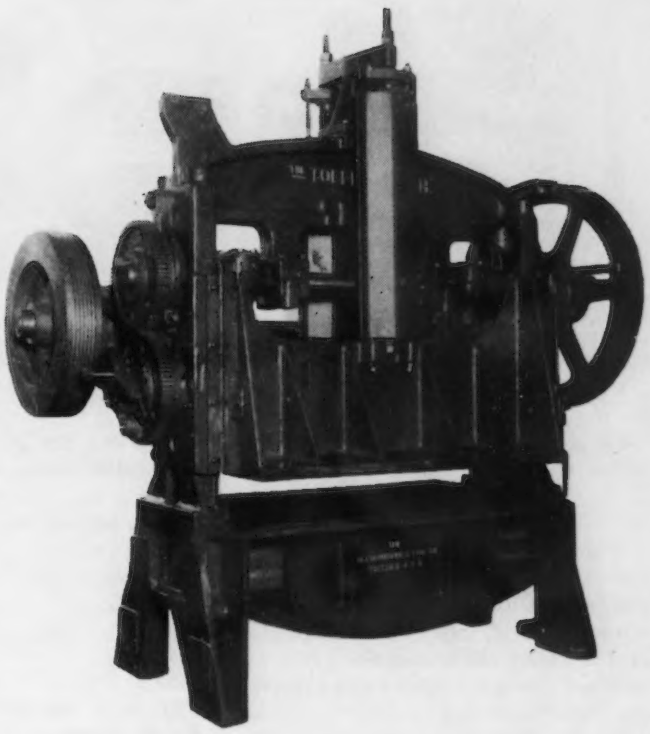


FIG. 29 — Cutting and scoring press for non-metallic sheet materials, in this case corrugated cartons.

In the making of cardboard boxes and corrugated board cartons, the cutting of the outline and the more severe scoring for the folds or bends are performed in a variety of reinforced printing presses and more rugged blanking presses. The carton blanking and scoring press in Fig. 29 has a bed area of 44 x 72 in., a rating of about 70 tons and operating speed with automatic feed of about 60 strokes per min. Structural extension tables, a light reciprocating feed frame driven from the quick return crank at the side of the press, and releasing gripper fingers to carry sheets from the front table to the working position and thence to the separating and stacking position, complete the unit. This press is rigid and well counterbalanced and the knife edges cut against a saw steel plate. Special long slide guides permit offside cutting and scoring as carton sizes vary.

The punches, Fig. 30, are built up of steel rule cutting edges and steel or hard brass scoring strips set in a hard wood or masonite matrix screwed to a ¼ in. steel chase or backing plate. Rubber strips tacked or glued to the

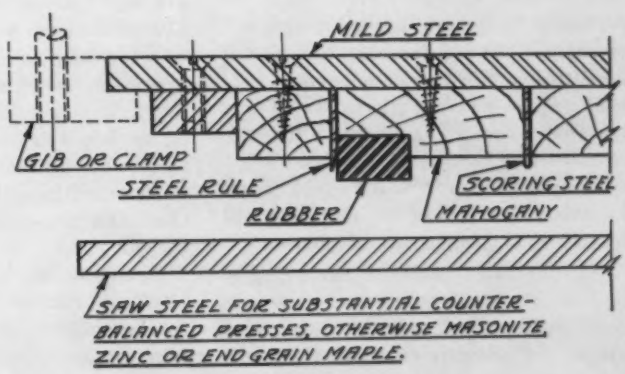


FIG. 30—Steel rule cutting and scoring dies for non-metallic sheet materials are inexpensive and easy to slip into place on the press slide.

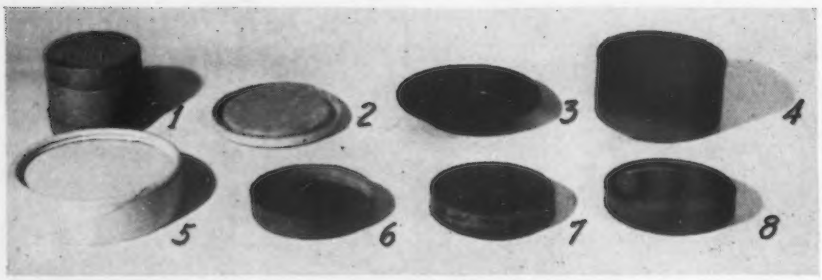


FIG. 31—Cutting, drawing, curling, folding, ironing, trimming and upsetting operations employed to produce these soluplastic paper base parts. No. 2 also contains thermoplastic paraffine while 3 and 8 contain thermosetting resins, and cure hard and durable.

wood along the cutting edges take care of stripping.

Drawing Paper Cups

Paper cups or box covers, spoons, pie plates, round or square picnic dishes, etc., can be drawn, formed and curled quite smoothly, though limited in general to fairly shallow shapes, Fig. 31. In sheet metal drawing which involves reduction of circumference,[18] compressive rearrangement of the flange material sets up a tensile strain which increases as the draw becomes deeper or the reduction becomes greater. Paper is a mixture of various constituents all of which contribute to compressive resistance, while only the binder contributes to tensile strength. Hence tensile strength of paper is much less than its compressive strength and only a small reduction can be taken at a time. Considering paper as soluplastic and adding water by spray, steam or humid storage to soften it for plastic forming, the moisture must be precisely distributed and only just enough added to soften the water soluble binder. Alternative theory indicates preference not to remoisten but to retain proper moisture from initial manufacture to fabrication. Whichever is correct, precise moisture regulation has seriously hampered paper forming operations, but electronic control of moisture content, as developed in general paper making, seems to offer a solution. Fig. 16 shows the difference in moisture relation for a few different paper mixtures, and Fig. 17 shows in part the effect of moisture content on physical properties of paper.

Simple cups, such as parts 1 and 6, Fig. 31, are blanked and drawn in combination dies[19] usually heated with steam or electric heating elements to dry out the plasticizing moisture. Often the cups are pushed down through the die and on through a slightly heated tube to hold the shape a little longer. The presses most often used have been double-action cam presses,[20] frequently fitted with roll feeds,[21] although the scrap cutter generally used is likely to be replaced with a rewinder. Fig. 32 shows a Bliss paper cap can drawing press dating back to 1905 and fitted with means to dip the paper in the course of roll feeding and rewinding. Operating speeds range around 80 to 140 strokes per min. Part 4, Fig. 31, was too deep to draw smoothly in one operation without tearing. Accordingly, the draw radius was corrugated to fold the surplus material in a series of uniform corrugations and these were ironed together evenly as the shell was pushed down through the hot die.

Combinations of roll feeds for coil stock and ratchet or friction dial feeds for secondary operations in completing the part, may be arranged on suitable presses. Thus the hard and durable plastic screw cap, part 8, Fig. 31, was carried through its series of operations in a roll and dial fed single action press. The 1/16 in. soluplastic and thermosetting (phenolic) paper must be blanked from the coil, hot drawn and crown stamped, upset with a sectional punch and possibly pinch trimmed before it is cured.

Dwell Often Required

With proper moisture control and timing, some paper shapes can be blanked and formed in fast crank presses (as in powder preforming). Others require a dwell to hold them briefly under pressure for a drying set and frequently with the application of heat. Thus a variety of paper plates, round or rectangular and plain or fluted are cut and formed with the 180 deg. dwell of such a press as that in Fig. 33 at speeds of 20 to 80 S.P.M. Thermosetting papers may be cured thereafter or preheated and cured quickly in thin sections. Part 7 in Fig. 31 is a soluplastic paper (said to be corn fiber) in which a thermosetting binder (also a corn product) was mixed in the beater in the initial production.

Curling, or false wiring of paper and similar plastic non-metallic materials, part 5, Fig. 31, acts much like metal curling,[22] except that rolls are

[18] *See Figs.* 135, 136 *and* 137, *Plastic Working of Metals—Crane, 2nd edition, John Wiley & Sons, Inc.*

[19] *Figs.* 74 *and* 276, *Plastic Working of Metals—Crane.*

[20] *Fig.* 277, *ditto.*

[21] *Fig.* 159, *ditto.*

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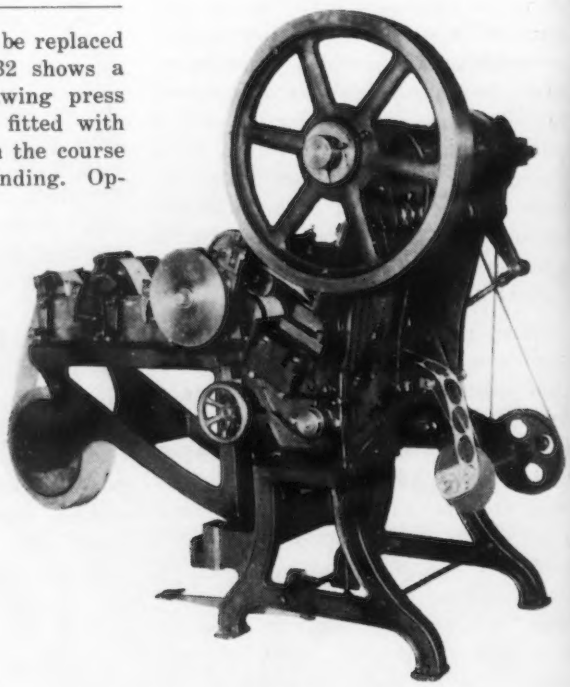

FIG. 32—A paper cup blanking and drawing press, specially fitted with paper dipping stations.

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ordinarily not used. For example in curling exposed ends of spiral wound tubing, a high speed head is revolved in proper direction relative to the spiral. Inserted in it, instead of curling rolls, are hardened pins, which are replaceable because of the considerable abrasive action of some constituents of the paper. These pin inserts are grooved to the profile of the desired curl and radiused on the leading or working edge. The use of pins instead of rolls is presumably to generate heat to set the shape.

[22] *See Figs.* 110 *and* 114, *Plastic Working of Metals—Crane.*

Thermosetting Papers

Thermosetting papers, cured in laminated flat panels or formed and set to shape (Fig. 42, Part V) with proper heat and pressure have taken considerable strides in a variety of fields. They naturally offer the same strength, hardness and appearance as molded phenolic, urea and melamine resins made with wood flour fillers. Possibly the phenolic paper laminates, due to longer fibers better arranged in the paper making process and the need for less plasticizer or lubricant, are even more serviceable than the molded product. Obviously thinner sections in proportion to area and faster curing times (and therefore less material and manufacturing cost) are possible as compared with parts molded from powders.

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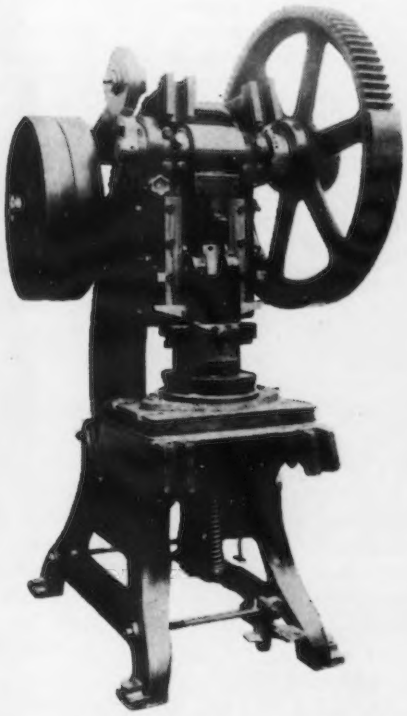

FIG. 33—A No. 20 inclinable single action cam press with heated die for a brief dwell (1½ sec.) in molding and setting a paper plate to shape.

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Manufacture of resin bearing papers initially required starting with Kraft or other suitable commercial paper and applying by spray or dip a desired proportion of synthetic resin dissolved in alcohol or other solvent. Some further advantage is gained by large users who recover the solvent from drying towers. To meet demand paper manufacturers are beginning to offer stock in which thermosetting resins have been combined in the mixing vats with wood pulp or other natural fibers. Cost varies with color, the proportion of resin required and the plasticizer. Controlled water content has been found to be an ample plasticizer for handling and forming prior to curing. However, the water goes off in steam at the cure and may have to be restored or a high boiling point plasticizer added to avoid brittleness and jagged fractures in punching.

Thermosetting Fabrics

Thermosetting fabrics impregnated with phenol-formaldehyde and other resins find substantial demand for such products as panels, gears, bearings, pulleys and tubes, and machined, formed and punched shapes. Fabric as a reinforcement contributes especially to impact strength. Full width coils, narrow slit coils, sheets and macerated filler in fine and coarse weaves are widely used. The cellulose molecule chains of cotton fibers seem especially desirable but asbestos (crystalline fiber) fabrics for somewhat higher temperature applications, sisal (hemp) fabrics and glass fabrics are also used.

FIG. 34—A laminated jug cap blanked, drawn and cured from layers of 45 per cent phenolic X-crepe (gathered fabric) at the left. Courtesy Cincinnati Industries, Inc.

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Creping Adds to Formability

Creping or gathering of both paper base and fabric base materials adds greatly to their stretchability or formability without fracturing the reenforcing base material. The samples in Figs. 24 and 34 are interesting in this respect. All are produced from crepe paper and fabric base materials carrying 10 to 50 per cent of resin as required and known as X-crepe. The processed coil stock has crepe puckers or corrugations crossing each other at about 45 deg. each way to the length, giving a 20 or 25 per cent surplus for forming either in single thicknesses or laminated.

Resin bonded fibers promise the manufacturing shortcut of a direct combination of cotton or other vegetable fibers with synthetic resins and plasticizers into an economical formable and/or curable coil material. Reference to the discussion of high strength synthetic oriented polymer chains in connection with Fig. 11, indicates that naturally polymerized molecular chain fibers of wood, cotton, hemp, corn, etc. (and in some cases cow hair and wool) may be made the base of high strength materials. Such fibrous strands, laid parallel and overlapping and impregnated with thermoplastic or thermosetting binders and such plasticizer as may be required, offer a wide range of utility. A combination of initial cotton fabric or felt making procedure and modified paper making methods as a basis of economical manufacture has been discussed briefly by Goldman and Olsen.[23]

[23] *Modern Plastics, May* 1943, *page* 100.

(To be concluded)

Multiple Cut Hobbing

By H. BYNG and E. ERICKSON
Schenectady Works, General Electric Co.

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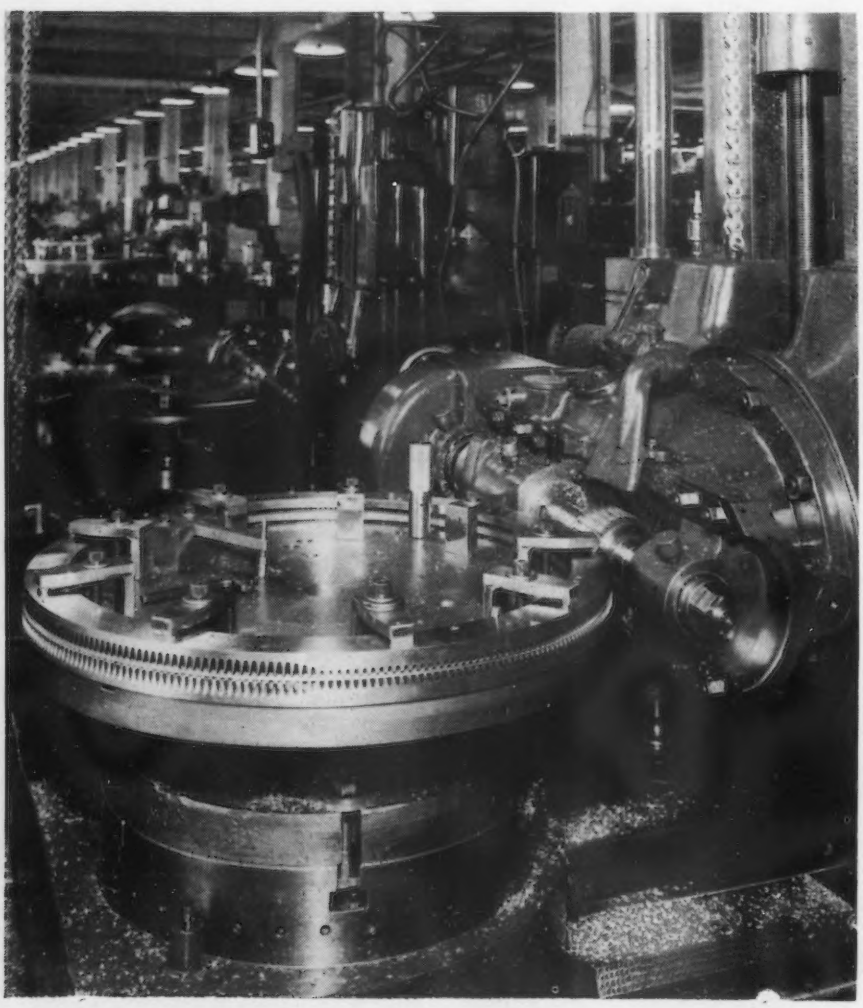
SEVERAL modifications in the chamfering of the ends of gear teeth in a bevel ring gear by the hobbing process have resulted in a saving of 82 per cent in production time. The gear is cut from a centrifugally spun bronze casting and has 270 teeth of 10 d.p. and 14½ deg. pressure angle. Face width of teeth is 1 in. and the depth of the gear at the o.d. is ⅞ in. The gear is 27 3/16 in. across its outside diameter and has a step flange of 23.500 in. diameter with assembly bolt holes drilled in this flange.

Formerly, after the bevel teeth are cut, this chamfering operation was performed on one ring gear at a time through the use of a special fixture on a hobbing machine, Fig. 1. The fixture included a hinged, tooth-shaped locating pin to insure a correct start and uniformity of operation. A vertical feed of 0.1 in. per rev. was used in conjunction with a speed of 30 r.p.m. of the 4-in. hob cutter, while the work made approximately seven revolutions. Thus the required tooth chamfer was gradually machined to the root diameter, the total time required being 66 min.

A new method was proposed to perform this chamfering operation on two gears at once. This included the use of a gradual, horizontal feed into two ring gears mounted with the teeth of the two gears facing each other and with a ring spacer between them. The top gear was located and alined with the lower gear through the assembly holes in the step-flange. After additional clamping, the ends of the teeth at the outer surface were hobcut in the same manner as a worm wheel.

FIG. 1—Gear-hobbing machine set up for machining tooth chamfer, showing hinged tooth-shaped locating pin at "A" used for old and new method.



In this method certain difficulties presented themselves, mainly pertaining to a uniform means of properly locating the top gear. This problem was tentatively set aside and a supervisory development was tried in which the cutter was "plunged" into one gear at a time until the desired depth of cut was reached. The automatic feed was then engaged, the work making slightly more than one revolution, with the path of the cut extending only about one-fourth of the way across the outside diameter surface or gear thickness. This development reduced the time of the chamfering operation from 66 min. to 17 min.

Meantime, the difficulty in properly locating the top or second ring gear was solved. This was accomplished by jig-boring three holes in the table into which pins of suitable height were pressed. Slip-bushings for these pins were made to facilitate the loading and unloading of the fixture. The circle determined by these extension bushings corresponds to the 23.500 in. diameter step-fit on the fixture which locates and prevents any lateral movement of the lower ring gear. The three pins assure concentricity of the steel ring spacer and the upper or second ring gear. The steel spacer ring, approximately ¼ in. thick, was machined with similar angles across each face complementary to the face angle of the ring gear. A short steel dowel, about ¾ in. long, was permanently pressed into the spacer ring. Each protruding end was shaped to the tooth contour and is about 0.003 in. smaller than the gear tooth space at the pitch line to facilitate the loading and unloading of the fixture. Additional clamping facilities were necessary, being specially made to suit the entire assembly.

As shown in Figs. 2 and 3, the first

# of Ring Gears

ring gear is properly positioned over the three pins, with teeth up, and rests across the 23.500 in. fit on the original circular plate fixture. The tooth-shaped locating pin hinged to the fixture is employed to insure consistent location, and the gear is then clamped. Next, the steel spacer ring is lifted and placed in position with the lower protruding portion of the tooth-shaped dowel engaged by a tooth of the lower gear. The second

o o o

FIG. 3—Gear-hobbing machine set up for machining tooth chamfer on ring gear in multiples of two. Top ring is removed to show steel spacer ring with tooth alining dowel at "A" and pin extensions of i.d. for concentric alinement at "B."

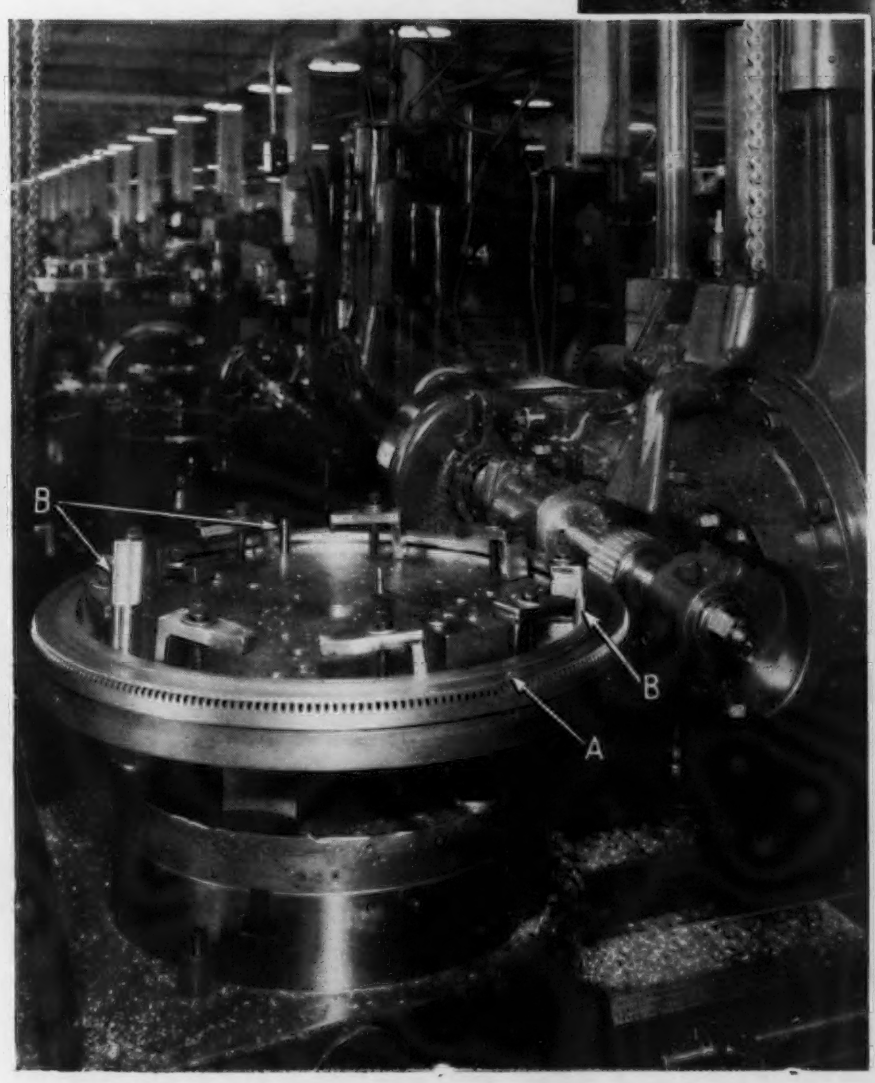


FIG. 2—Gear-hobbing machine set-up for machining tooth chamfer on ring gear in multiples of two.

o o o

or upper gear is then placed over the three locating pins previously mentioned, and the upper protruding portion of the toothshaped dowel of the spacer ring is engaged by any pair of teeth, which face down. This assures positive and uniform alinement of all successive set ups. The assembly is then suitably clamped and the hob cutter centralized between the two ring gears. The cutter is fed by hand or "plunged" into the two ring gears and the hob chamfer operation is completed by the new method previously described for a single gear.

The result of this idea enabled a further saving in time to be made. The time for this operation originally was 66 min. for a single gear, whereas it now takes only 23 min. in multiples of two at a time or less than 12 min. per gear.

Form Tools Salvaged by Low-Temperature Brazing

SAVINGS of between 56 and 78 per cent on reclaimed high speed cutting tools used on a shell production line of the Armstrong Cork Co. of Lancaster, Pa., have been effected with the introduction of low temperature brazing of worn tools formerly discarded as scrap to shanks of ordinary steel. Castolin No. 16 alloy, made by the Eutectic Welding Alloys Co., Inc., is used.

As a result, production costs have been sharply reduced through savings of high speed steel and through the elimination of hundreds of manhours of skilled labor previously needed to prepare the tools. At the same time, the process has made it possible to release substantial quantities of high speed steel for other essential war production.

The brazing process has virtually doubled the life of each form tool. Manufactured of 18-4-1 high speed steel, the tools are used on eight spindle, Conematic automatic screw machines. They measure 2⅞ in. in length and formerly were scrapped when worn down to 1½ in. in length.

By brazing the used tool to a shank of SAE 1020 carbon steel, Armstrong has been able to increase its output of 20-mm. armor piercing shot from an average of 25,000 to approximately 50,000 per each cutting unit. Only a small sliver of high grade steel remains when the tool is finally discarded.

The reader is also referred to "Furnace Brazing of Form Tool Tips," July 1, p. 47, THE IRON AGE.

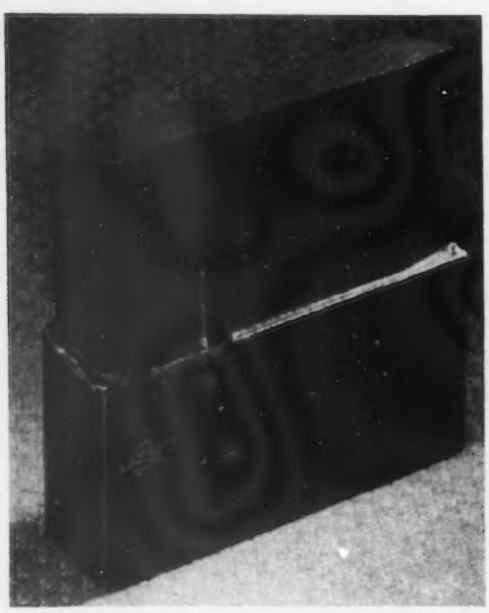
A highly important cost factor in the use of these high speed tools has been the number of manhours required for machining, heat treating and grinding each unit. Armstrong purchases high speed steel in bar stock. After cutting to length, the tool must be machined, heat treated to achieve the desired degree of hardness and then ground. The use of the low temperature brazing process substantially lowers labor costs since the reclaimed tool retains its original temper and contour.

The suggestion of brazing used tools to shanks of ordinary steel was advanced by several Armstrong workers. They investigated the possibility of reclaiming high speed after noticing quantities of worn tools scheduled to be discarded as scrap. Two major factors were involved. The first—that the tool would withstand cutting pressure after brazing. The second—that the temper of the steel would remain unchanged after brazing.

As a factor in reducing production costs on shell operations, the successful development of low temperature brazing in reclaiming used tools is significant. Four form tools made of high speed 18-4-1 steel are required on each Conematic machine. Armstrong officials estimate that the cost of each new form tool is approximately $27, the major part of which represents skilled labor charges. Conservative estimates indicate that the reclaiming job can be done at a cost of between $6 and $12, thereby saving between $15 and $21 on each reclaimed unit.

LEFT

FIG. 1—This used high speed steel form tool, worn down from its original length of 2⅞ in. to 1½ in., was formerly scrapped. Manufactured of 18-4-1 steel, it is used on Conematic automatics on shell production lines of the Armstrong Cork Co.



o o o

LEFT

FIG. 2—The worn cutting tool is now brazed to a shank of SAE 1020 carbon steel. In the process, the original contour and temper of the tool are retained. No machining or heat treating is required, saving hundreds of manhours of skilled labor.

o o o

RIGHT

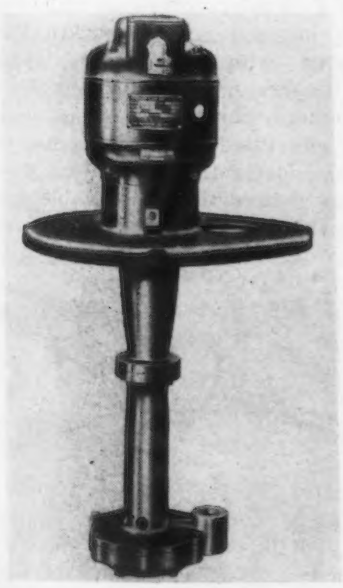
FIG. 3—The life of the reclaimed tool has been doubled by the low-temperature brazing process. When finally scrapped, only a fine sliver of high speed steel remains. The operation represents a dollar saving of between 56 and 78 per cent on each reclaimed unit, and releases high speed steel for other essential war operations. The tool shown at the right has also been reclaimed by low temperature brazing.

New Equipment . . .

Small Tools

New developments in coolant pumps and accessories, milling cutters, dressing tools, inspection gages and measuring devices are described in the following pages.

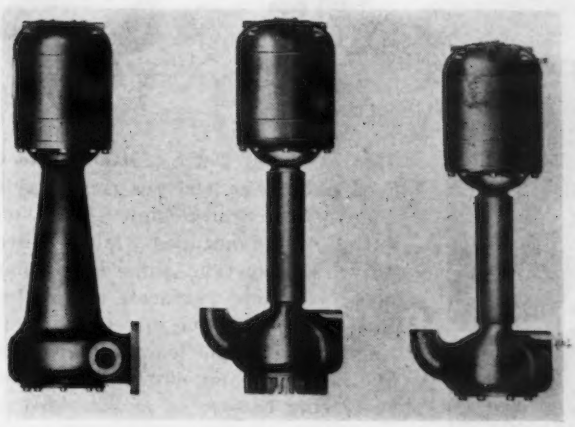
DESIGNED for deeper immersion, the vertical Gusher coolant pump Model TL has been developed by the *Ruthman Machinery Co.*, 1810 Reading Road, Cincinnati. The unit is provided with an integral mounting flange which is bolted to the reservoir cover or bed plate. The shaft, which rotates on two large high grade ball bearings, is of one-piece construction, and extends from the motor through the tubular housing to the pump impeller. One ball bearing is mounted in the upper motor end bell, and the other within the mounting flange housing, providing sufficient distance between the ball bearings to maintain rigidity in the heavy shaft extension.



The unit is available in two lengths from the mounting flange to the bottom of the pump, one 23⅝ and the other 19⅝ in.

Coolant Pumps

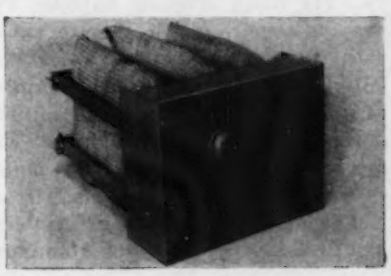
THREE new coolant pumps, each available in 17 standard sizes, are announced by *Pioneer Pump & Mfg. Co.*, 19669 John R, Detroit. Since each pump presents the possibility of many different applications, the user is enabled to keep his inventory reduced to a minimum. Model VBD has three outlets to permit



piping on either right or left side, or back into coolant sump through intake bracket; Model VA is used where submersion in coolant sump is more practical or less objectionable than outside mounting would be; and Model VC is for external use where a tank cannot be utilized efficiently, mounted with either vertical or horizontal bracket.

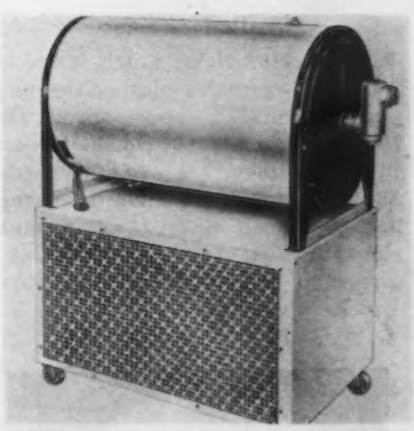
Coolant Strainers

TWO coolant strainers which are recommended for machine tools requiring greater than usual straining capacity are being offered by the *Metal Textile Corp.*, Orange, N. J. Model G (the "grinder model") has an unusually high capacity achieved by a combination of three filter elements held side by side by thumb nuts which make them easily removable. The essential function of Model G is to prevent chips or particles from being recirculated in the coolant flow and thus to avoid scoring in the grinding operation. When installed in the sump tank, before the circulating pump, the strainer offers the additional advantage of keeping the pump free of chips or lint. In cases where the size of the coolant tank will not accommodate a triple-unit filtering element, the new Metex Model H strainers may readily be installed. As many units as required may be installed in any position in the tank where space is available. Capacities of the Model G ranged from 15 to 60 gal. per min., while various sizes of the Model H are suitable for capacities from 5 to 20 gal. per min.



Portable Coolant Cooler

A PORTABLE coolant cooler, originally designed to meet specific bottleneck restrictions of certain



screw machine and automatic lathe plants, is announced by *Revco, Inc.*, Adrian, Mich. The unit is said to be satisfactory for cooling both straight oil and oil-water emulsions. It is 44 in. long, 24 in. wide and 49 in. high. The tank is welded construction, galvanized finish and operates under a working pressure of 127 lb. per sq. in. Refrigeration is supplied by a ¾-hp. air cooled, four cylinder Freon-12 condensing unit. Capacity

of cooler is 7000 B.t.u. per hr. Type of strainer supplied depends upon kind of work and metal being processed.

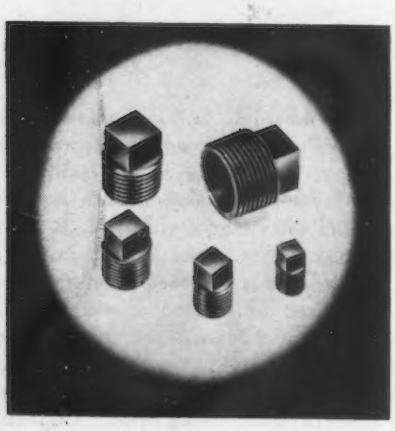
Coolant Spout

EASILY fished under, over, through or around rigid machine parts, the "Bullseye" coolant spout offered by *J. N. Fauver, Inc.*, 51 West Hancock Avenue, Detroit, is readily adjusted by finger-tip pressure to any angle or curve, directing

the coolant stream directly on the tool. Its flexibility permits its easy readjustment as the work progresses and eliminates the elbows, tees, ells, connectors and adaptors that complicate rigid piping. Available in a range of sizes in any length, they are adjustable for oil, air, water, steam and grease.

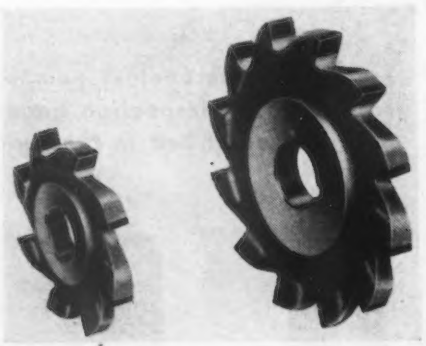
Plastic Pipe Plugs

MADE of light, tough, durable, non-corrosive plastic, the pipe seal plugs made by *American Molded Products Co.*, 1644 North Honore Street, Chicago, are said to effectually protect threads of units in storage or transit against all damage, moisture, dirt, weathering, rust and corrosion. Sizes of ⅜, ½, ⅝, ¾, and 1 in. are available.



High Speed Milling Cutters

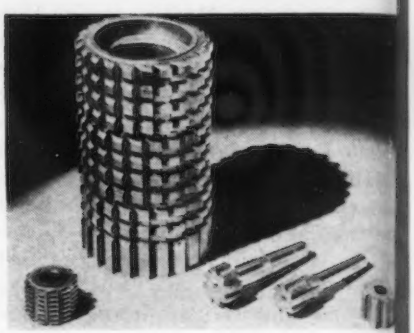
A NEW type carbide tipped milling cutter with cast alloy body developed by *Super Tool Co.*, 21650



Hoover Road, Detroit, has a rate of feed more than 600 per cent heavier than with regular high speed steel cutters. Advantages claimed are: tripled production, finishes comparable to ground surfaces, less distortion of the work due to decreased cutting pressure, and less heat absorbed by the work and cutter due to the heat being thrown off in the chip. It is said these cutters are being used in steel at surface speeds of 400 to 600 ft. per min. with tooth load varying with the hardness of the steel from 0.005 to 0.0025 in. Standard four or six flute cutters for cutting cast iron, brass, bronze, copper, aluminum, magnesium and plastics are supplied in diameters from 3 to 8 in. in a variety of widths. For cutting steel sizes are made with six to sixteen flutes according to the diameter.

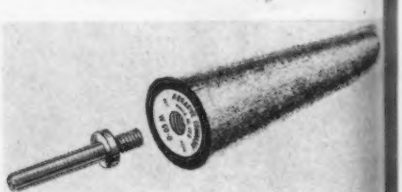
THE Grayson-Kennametal cutters developed by *McKenna Metals Co.*, 144 Lloyd Avenue, Latrobe, Pa., are constructed of Meehanite tipped with Kennametal for a variety of milling operations, including accurate face milling, side milling, end milling, slot milling and straddle milling. Employing double negative rake angles, various grades are available. Grade KM is for rough milling of cast iron and grade K4H for milling aluminum-silicon alloys, magnesium-aluminum alloys, brass, bronze, and other non-ferrous metals.

THE PLAN-O-MILL CORP., 151[1] East Eight Mile Road, Haze[l] Park, Mich., announces a line of mul[ti]ple thread milling cutters in Na[tio]nal, Whitworth, Acme, V, and spe[cial] forms, either ground or ungroun[d] for use on any type of thread millin[g] machine. The cutters are availabl[e] in a complete range of sizes wit[h] straight or spiral flutes, with or with[out] special tooth for removal of im[per]fect thread.



Mounted Abrasive Points

ABRASIVE CO., Tacony an[d] Fraley Streets, Philadelphi[a] 37, has put on the market Victo[r] points with demountable spindle[s] With these points, which consist of [a] threaded porcelain bushing inserte[d] in and fused to the abrasive whe[el] mass during the vitrification proce[ss] it is claimed the demountable spind[le] can be removed and reused on oth[er]

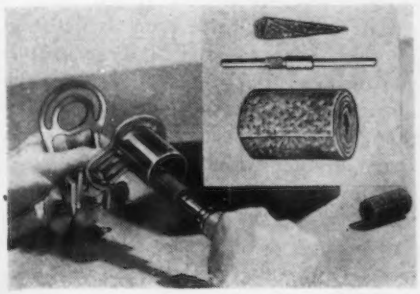


points. The spindle screws into th[e] threaded porcelain bushing and form[s] a tight fit, yet it can be quickly un[-] screwed to replace with a new poi[nt] without removing the spindle. Stand[-] ard grain and grain combinations i[n] vitrified bonded wheels or points a[re] available.

Flexible Abrasive Wheels

A NEW line of flexible abrasiv[e] wheels and points made by wind[-] ing a coated abrasive band upon itse[lf] is announced by the *Flex-Abrasiv[e] Co.*, 100 North LaSalle Street, Chi[-] cago. A fresh abrasive surface [is] constantly in contact with the wor[k] and full use of the spiral roll is al[-] lowed, down to its final layers. Man[-] drels are of tapered thread construc[-]

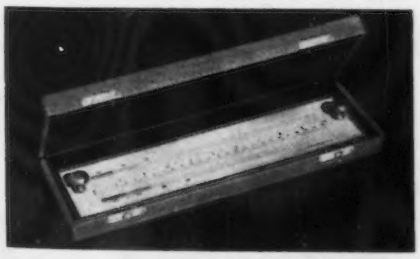
tion which firmly locks the abrasive wheel or point to the shaft by its rotary motion. The wheel can be removed or replaced without use of tools, nuts, split shafts or grommets.



They are made in many different types and sizes for use on hard alloy steels, wood, rubber, resin and plastics.

Radius Charts and Projector Rules

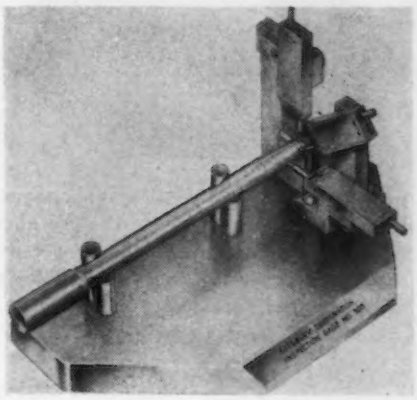
A SERIES of precision radius charts in various magnifications for quick and convenient use on the viewing screens of comparators, micro and contour projectors and for more permanent installations in these instruments, has been prepared by the *Universal Engraving & Colorplate Co.*, 588 Monroe Street, Buffalo. These charts of radii can be supplied in all sizes up to 30¾ x 30¾ in., in square, rectangular or circular form. They are composed of fine black lines and easy-to-read numerals on the finely ground surface of selected plate glass. The company also offers a projector rule, illustrated, made of ¼ in. thick plate glass, with all dimensions and



numerals on the under side of the ruler. It is supplied in lengths of 6 to 24 in. and each rule has graduations of hundredths, sixty-fourths and millimeters.

Inspection Gage

SEEKING a method of speeding up final inspection of draw punches, the *Salisbury Corp.*, 1161 East Florence Avenue, Los Angeles, have developed in their own shops a final inspection gage requiring only one-sixth the time formerly needed for checking draw punches. The gage consists of a machined base approximately 14 in. long on which is mounted the necessary tool supports and three Koch test indicators. The tool which this gage was designed to test is a precision ground draw punch, having three tapers. Checking the diameters on these tapers formerly required three separate micrometer readings by a trained inspector. These three ooperations are now done at one time by laying the tool on the gage and checking all three diameters at once. By adding additional indicators, as many simultaneous inspections as needed may be made. The gage is not for sale.

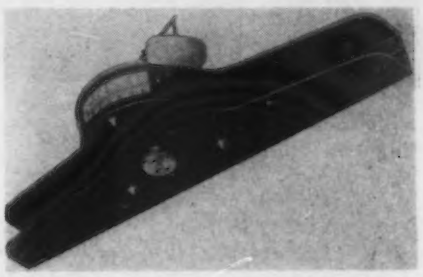


Diamond Dressing Tool

A DIAMOND dressing tool for thread grinding wheels, developed by *Wheel Trueing Tool Co.*, 3200 West Davison, Detroit, permits not only straight dressing but angle, radial and multiple form dressing as well, according to the manufacturer. It is said that because this tool produces exceptionlly clean cuts, forms are obtained quickly and held longer. A production increase from an original production of 8 to 80 units per machine per day is claimed. The tool may be used for dressing the wheels that grind Whitworth, Buttress, Acme or any other standard or special thread.

Vernier Angle Gage

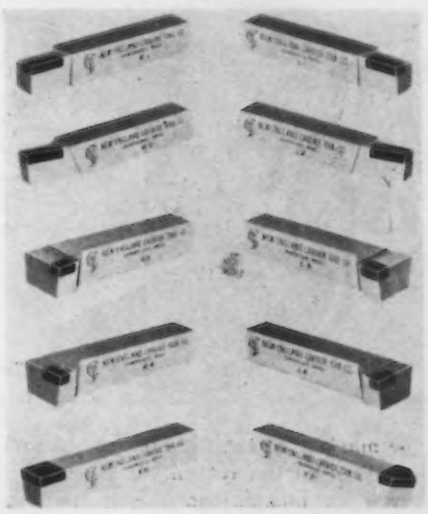
DEVELOPED by *Engis Equipment Co.*, 310 South Michigan Avenue, Chicago, a portable vernier angle gage, the Clinometer, for use on various types of machine tools and for test setups in the inspection room, is offered in five models. The action of the instrument is by a free swinging drum graduated in 360 deg. which is supported by ball bearings. When the device is applied to an inclined surface, the drum swings to a position which brings the center of gravity under its center line. The degrees of inclination can be read from a pointer located above the drum. Minutes of the arc are indicated by a separate vernier scale. Reading is facilitated by a patented brake mechanism and by an attached magnifying glass which enlarges both the degree scale



and the vernier scale. Through a hand knob brake, the rotating drum can be locked in position. Special scale graduation in mils or degrees of slope can be furnished.

Carbide Tipped Tools

A COMPLETE line of standard tungsten carbide tipped tools is announced by *New England Carbide Tool Co.*, 80 Brookline Street, Cambridge, Mass., which includes four styles of tools, both right and left-hand as well as pointed and square tipped. These are furnished in U grade for cutting all materials except steel, such as aluminum, cast iron, brass, bronze, non-metallics, etc., and in S grade for cutting steel.



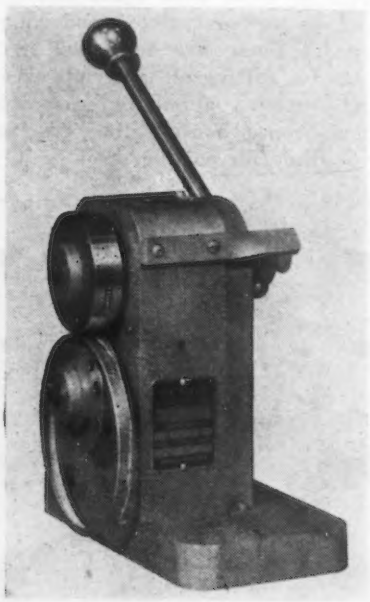
Adjustable Boring Bars

THE multiple cutter adjustable boring and reaming bars introduced by *State Mfg. & Construction Co.*, Franklin, Ohio, are said to be of particular use on bomb and shell boring jobs where, by the attaching of a collar, holding facing and chamfering tools, three operations can be done simultaneously. Bars with pilots, wear stripes and collars are available, as well as a duplex bar containing

two sets of multiple cutters for boring two different diameters.

Hand Roll Marker

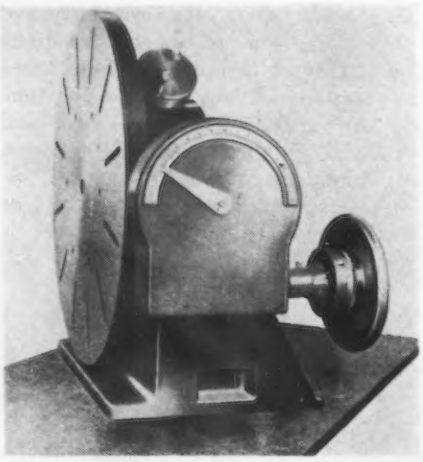
A UNIT to be used for numbering and marking thin walled tubings, bevels and similar cylindrical parts has been put on the market by *Wm. A. Force & Co.*, 216 Nichols Avenue, Brooklyn. Using a locating anvil, the parts to be marked are rolled in synchronization with a standard roll type holder or convex indenting head. The unit shown utilizes standard roll marking type and roll holder, since interchangeable lot numbers are desired. The piece to be marked can be loaded at either end of the stroke, so that one piece can



be marked on the forward stroke and another on the return. It is claimed even an inexperienced operator can mark about 500 pieces per hr.

Measuring Device

FOR measuring large castings for radial motors, *Machine Products Corp.*, 6771 East McNichols Road, Detroit, has developed the Rotab, which has a 36-in. circular table on which the work to be measured may be clamped. Without disturbing the original clamping, an inspector can measure all the angles on the work. By means of geared turning wheels the table can be rotated to any degree and to any angle from the vertical to the horizontal position and then 30 deg. below in the opposite direction. It can be locked in a fixed



position, but may be disengaged to rotate freely by hand. It may also be used as a holding fixture for boring mill setups. An auxiliary table is provided as a substitute for the 36-in. plate if needed for smaller work.

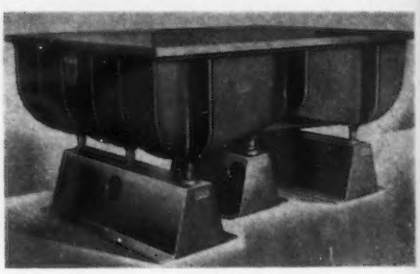
Surface Plate Stand

A PORTABLE, all-steel surface plate stand equipped with wheels for easy portability from one plant to another has been introduced by the *Challenge Machinery Co.*, Grand Haven, Mich. It is available in three standard sizes to accommodate 18 x 24, 24 x 24, and 24 x 36 in. surface plates and is also obtainable without wheels in stationary models.

The company also manufactures an 18 in. round lapping plate which is provided with two handles for easy handling. The surface is grooved in two directions, one set of lines running at 90 deg. to the other.

Surface Plate

A SURFACE plate measuring 4 x 6 ft. with a depth of 20 in. and total weight exceeding 2 tons has been designed by *Machine Products Corp.*, 6771 East McNichols Road, Detroit. Made of Meehanite iron, it is thoroughly heat treated and accurately scraped. It is mounted on specially designed pedestal type base, and is provided with three adjustable bearings supplemented by additional adjusting screws for leveling purposes. It is said the plate cannot be dislodged by reason of floor vibration or other causes and will remain uniformly level.



Steel Layout Ink

FOR use in precise layout work on dies, templates and machine parts, *The Doall Co.*, 1201 Thacker Street, Des Plaines, Ill., is offering a steel ink with quick drying properties. Under average conditions it will dry hard enough to start layout 1 min. after application. It is claimed that the ink will adhere to ground surfaces of steel with tenacity and will not shrivel, check or crack. It is not easily abraded by the action of chips in machining operations and is not attacked by machine oil or the usual cutting and soluble oils, yet it can be readily removed with an alcohol-moistened cloth.

FREE

New "Copper Guide" for war industries

Here is a book that puts at your fingertips information about Revere copper and copper alloys that users most frequently need. That answers most of the questions asked of Revere by the mechanical industries engaged in war work! Compiled especially for your use today. And organized like a handbook for easy reference.

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• Long range planning vindicated in Sicilian landings . . . Industry began to plan three years ago to make present flow of goods possible . . . Canada bans advertising of synthetic rubber . . . Labor priority system being drafted in Detroit because of shortages.

DETROIT—In the landing of 14,000 American vehicles and 600 American tanks on the shores of Sicily—"imports" which were welcomed by the Sicilians, if not by Italy's Axis partner—the manufacturers who built these products strictly for "export" to the Axis see again the advantages that come with long-range planning. Reports on the Sicilian affair were the occasion for a summary by the Automotive Council for War Production, which estimates current deliveries to the armed services at more than $725,000,000 monthly in aircraft, tanks, vehicles, guns, marine equipment and ammunition.

It is approximately three years since the industry began to plan and to build itself up to the task of turning out this $9,000,000,000 yearly flow of materials, and the output in the past twelve months has been snowballing. As witness to that snowballing, here are some graphic facts cited in comparison of current volume and the level of last year:

> Currently, aircraft, aircraft engines and parts are being produced at an annual rate of $3,228,000,000, or the equivalent of 9,250 complete Flying Fortresses. A year ago the annual output level of this industry had reached only the equivalent of 3,670 Fortresses.
>
> Tanks, tank destroyers and parts—current rate $1,320,000,000 annually, equivalent to 17,600 General Sherman medium tanks. Last year at this time the rate equalled only 5,760 similar tanks.
>
> Vehicles and parts—now $2,149,000,000, enough money to buy 2,390,000 jeeps. Last year the output of military vehicles was equal to 1,930,000 jeeps.
>
> Guns—annual rate $766,000,000, equivalent to 512,000 .50-caliber machine guns. Rate at this time last year was only equal to output of 267,000 machine guns.
>
> Marine equipment—rate is $644,000,000, equivalent of 2,376 (PT) torpedo boats, almost double the rate at this time last year, when it was equivalent of only 1,280 torpedo boats.
>
> Ammunition—annual rate now is $150,000,000, equivalent of 45,000,000 anti-tank shells, compared with the annual rate a year ago which was equivalent to 21,700,000 shells.

AS is apparent, the industry's wheels must be turning nearly three times as fast as they were last year at this time.

A Canadian ban on the advertising of synthetic rubber or of products made of such material draws interest because the move is opposite to the trend on this side of the border, where the idea seems to be to build up an advance anticipation for the substitute material. Best interpretation would seem to be that there is a basic difference in outlook between ours and the Canadian or British viewpoint. Britain will again rely on natural rubber when its sources have been recaptured from the Japs, whereas American hopes, official and private in the rubber industry, are being tied to the new synthetics. The British choice is, of course, influenced by ownership of the natural rubber sources, and by the desire not to put those sources out of business. Our own choice, and the lesson taught at Pearl Harbor, is not to put all our rubber "eggs" in one basket—so far from home.

New materials are getting a friendly eye, wherever they crop up these days. One on the unusual side is plastic for piston rings, an example of the functional uses to which synthetics may be applied. Actually it is not probable that plastics would be used for making the entire ring, but bakelite inserts have been found to have very good oil sealing characteristics and wear resistance in some applications. Engineers in the automotive industry have already cocked an interested ear to hear the reports of successes chalked up in some special equipment with this material incorporated. Research is continuing.

AUTOMOTIVE spring manufacturers can be expected to listen with interest to reports that leaf springs have been utilized for an airplane landing gear. The leaf spring manufacturers were on the defensive in recent years because the coil spring type of suspension was very popular. Research paved the way for at least a partial comeback for the leaf spring people, who demonstrated that their product could give as soft a ride as the coil spring. The prospects for the leaf spring on airplanes would be brightened by a comparison of costs between the springs and conventional airplane shock struts, devices requiring extreme precision in manufacture.

Experiments with the leaf springs for landing gears are reported from Wright Field, and have their origin in a landing gear used on a racer built in the Midwest a few years ago. William B. Stout, noted designer of planes, also has sponsored the idea in connection with the four-wheeled automobile type landing gear he has developed.

When Chrysler was making everyone finish-conscious with its publicizing of the Superfinish process there was certainly no thought that it might be used to produce 24-inch parabolic reflectors for Navy searchlights. Fortunately, the work on Superfinish sponsored by Dave Wallace, president of the Chrysler division, had resulted in the building up of a group of machine design specialists who were able to step up easily to the reflector job. They have designed special tools and machines which materially reduce production time on the finely polished discs.

Such reflectors for big searchlights are, as is generally known, made of metal rather than glass. It is interesting to know that experiments have been made in fabricating such discs by plating iron, about a quarter-inch in thickness, over highly polished

The Boy Who Worked "by the Book" *equaled the expert's time*

IT WAS A BIG, busy war plant. One of the toolmakers died, left his jig borer standing idle. And he was a crack man . . . an old-line craftsman who didn't take *anything* for granted, and turned out first-rate work with the earnest help of his Pratt & Whitney machine . . . not fast, but well.

In desperate nced of the work that machine could do, the superintendent went out to the toolroom and grabbed off a young fellow who was a good milling machine operator, but who had never handled a jig borer.

"Here," the super said, handing the boy the P&W jig borer instruction book, "study this, and tomorrow I'll put you to work on a bigger job than you've ever had yet."

Now, the super hadn't picked this boy by chance. He knew the lad was a good milling machine operator, and he knew *why* . . . because he followed instructions exactly as he received them, and trusted his machine's accuracy.

The boy tackled the jig borer, one eye on the work and the other on the book. After the first few days, he was able to use both eyes for the work. After a month, he was turning out the same production the expert toolmaker had achieved.

Two important facts are established by this true story. One, the accuracy is there, in the P&W Jig Borer, ready to be put to work by *any* conscientious operator. The expert had done his job well, but his extra skill could have been used better on work that only an expert can do. The boy, by taking full advantage of the P&W Jig Borer's built in accuracy, became a good operator quickly. This is a profitable lesson in using limited man power and skill.

Secondly, the instruction book that accompanies every Pratt & Whitney machine tool contains the essential facts about the machine . . . the boiled-down, clearly-presented "know-how" of P&W designers, engineers, production men, and machine operators who have been over all this ground before the machine ever reaches your floor.

Trust the Pratt & Whitney machine accuracy . . . read and follow the instructions . . . and you'll get maximum production.

PRATT & WHITNEY
Division Niles-Bement-Pond Company
West Hartford, Connecticut

PRATT & WHITNEY

MACHINE TOOLS ★ SMALL TOOLS ★ GAGES

WEST HARTFORD CONNECTICUT

Basic Accuracy for Mass Production

master forms. The product made this way requires little or no polishing. The plating process, unusual because it produces a fine grained, non-porous material, even in thick depositions, is a patented one developed for making molds in the tire industry.

RECENTLY Ford's Willow Run plant developed a new method of protecting plastic windows, "blisters" and enclosures on bombers from scratches which might accidently mar the plastics during the time the bomber is on the assembly line. The protection is a dipped coat of transparent plastic which peels off when the plane is ready to take to the air. Former protection consisted of four layers of latex and four layers of paper, plus a talc treatment. Applying this to each window pane and other plastic-covered opening, then cleaning it off when the plane was completed, took many man-hours, but it was necessary to protect from marring and paint overspray. The new method saves 40 man-hours per bomber. Moreover, its transparency permits light inside the fuselage, assisting workmen and workwomen doing installation work.

An automotive method of wire-stitching metal parts together has been improved and applied to aircraft work. It is speedier than riveting, requires less skill than welding, and seems to have many opportunities for adaptation to fastening jobs on secondary parts of aircraft. Its application in the automotive field was similar: Many of the sheet metal parts out of sight on autos, trucks and busses have been stitched together with steel wire.

An interesting history of broaching is contained in a booklet "A Quarter Century of Broaching Development." issued to celebrate the 25th year of operations by Colonial Broach Co., Detroit. A quarter of a century ago, no broaches were being produced in Detroit—and the city did not dream that it might today be a fair-sized maker of tools and machine tools, as well as an important user of both—and at that time broaches themselves were far less important than they are now. Broaching speeds current in industry then were about 6 ft. per minute, in contrast to the speed of 30 ft. per minute used today, the ground high-speed broach had not yet been introduced, and no standards of modern broach design or broach use had been established.

SEVENTY faculty members of midwestern high schools have begun an eight-week training course at Chrysler's Apprentice Training School in the Dodge Main plant here, their studies being intended to "prep" the teachers with a clearer insight in problems and opportunities in industry for young men and women today. The teachers are working for Master's or Doctor's degrees at universities of Michigan, Wayne, Northwestern or Cincinnati, and will receive credit for the work done at the Dodge school.

The course includes 40 hours a week of machine shop work, plus daily conferences on various phases of industrial management and operation, including problems of personnel, social service, employment and labor relations.

Because of Detroit's critical labor situation, a labor-priority system, limiting an employer's privilege to hire new workers according to the essentiality of his work in the war program, is being drafted here in the district office of the WMC, it has been announced by Edward L. Cushman, deputy WMC commissioner.

As reported here last week, unskilled labor is most critical, simply because training for higher paid jobs has been made easily available to all. Most skillful appeal for "common" labor is one voiced in the press last week when Montague A. Clark, in charge of the WMC office here, made a plea for sturdy men to work in foundries and forge shops. In language that stands repeating, Clark said:

"Our whole war effort is threatened by a shortage of labor in the foundries and forge shops which turn out the metal parts which go into every ship, airplane, tank, gun, and other weapons of war.

"The Army and Navy are clamoring for more munitions of every kind. We also must increase lend-lease production to speed the day of victory for the United Nations.

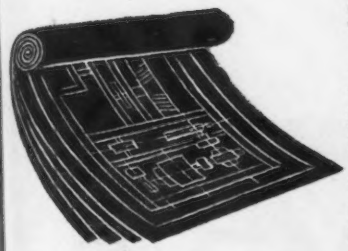
"Working in a foundry or in a forge shop doesn't have the glamor that goes with production of Flying Fortresses or Liberty ships, but the job is just as important, just as big a contribution to victory.

"It takes real men to do these jobs. They not only must have strength, but they must be able to stand up under hot, tough conditions and be on the job day after day. Such men, if now employed on jobs which do not use all their strength and skill, may transfer to foundry and forge work and be replaced in their present tasks by women."

THAT gives sweat and grime a "rating."

PROFESSORS from four midwestern universities confer with John M. Amiss, Chrysler director of industrial education, about the Apprentice Training School where 70 high school teachers will take an eight-week course to assist them in guiding young men and women who seek to prepare for industrial life. (See "Assembly Line.") Left to right are Dr. C. E. Erickson, Northwestern University; Prof. H. C. Messinger, University of Cincinnati; W. D. Merrifield, supervisor of technical education at the Chrysler school; Dr. H. C. Koch, University of Michigan; Hazel Bine, assistant instructor at the school; Mr. Amiss; Carl M. Horn, Michigan State Board for Control of Vocational Education; W. H. Winkler, in charge of selection and guidance for the school, and Dr. Arthur Stenius, Wayne University. These professors will be in charge of daily conferences during the last six weeks of the course. Each of the high school teachers will perform 40 hours a week of shop work during the course.

to help you



get the most out of STAINLESS STEEL

. . . Your engineers can use this information to take advantage of the high strength-weight ratio, corrosion resistance, wear resistance and permanence of Carpenter Stainless Steel. Of course, all Carpenter Stainless Steels could not be shown on a table of this size, so if you would like more information on the working properties of the various grades—or additional technical data—get in touch with us. Your nearby Carpenter representative will be glad to keep you in close touch with our Metallurgical Department, and supply helpful fabricating data.

TYPE OF PRODUCT	Carpenter Stainless Used and Analysis	Properties Provided by Stainless Grade—for a range of applications	RANGE OF PHYSICAL PROPERTIES*					OTHER RECOMMENDED USES
			TENSILE STRENGTH lbs. per sq. inch MAX./MIN.	HARDNESS MAX./MIN.	SPECIFIC GRAVITY	SCALING TEMPERATURE (Max. for continuous service)	IS IT MAGNETIC ?	
SCREWS BOLTS RIVETS	No. 1 (Type 410) C. .10 Cr. 13.00	This stainless provides fair machining and good cold heading properties. It contains just enough chromium to yield truly "stainless" properties. It resists the corrosive effects of fresh water, gasoline, crude oil, alcohol, ammonia, etc.	190,000 / 80,000	Brinell 387 / 179	7.78	1200° F	Yes	Carpenter Stainless No. 1 is also used for springs, valve trim, pump shafts, and many heat treated parts. Available in forging billets, bars, wire, and strip.
COMBUSTION ENGINE PARTS	No. 2 (Type 420) C. .30 Cr. 13.00	Where extra hard stainless is needed for wear resistance, this grade is excellent. It is used for tempered parts that must be harder and stronger than parts made from No. 1. Its corrosion-resisting qualities are similar to those of No. 1.	260,000 / 90,000	Rockwell C 52 / 196 Brinell	7.75	1200° F	Yes	Used only in fully hardened condition for surgical and dental instruments, ball bearings, gears, shafts, cams, ball check valves, etc. Available in same forms as Carpenter Stainless No. 1.
CHEMICAL PROCESS EQUIPMENT	No. 3 (Type 442) C. .15 Cr. 20.00 Cu. 1.00	This stainless is easy to form, bend, blank or punch. In addition to providing corrosion resistance to salt water, practically all organic chemicals and acids, it has excellent heat resistance properties.	125,000 / 90,000	Rockwell C 28 / 187 Brinell	7.69	1600° F	Yes	No. 3 does not become embrittled by grain growth at high temperature —used for scale resisting purposes. Furnace parts, soot blowers, ladles for molten non-ferrous metal, etc. are made from it. Available in bars, forging billets, strip, wire and welded tubing.
OIL FIELD EQUIPMENT	No. 4 (Type 302) C. .10 Cr. 18.00 Ni. 8.00	This tough and ductile stainless responds easily to deep-drawing, blanking and forging. It has all the corrosion resistance of No. 1 and No. 3, plus resistance to dyes, foodstuffs, most organic chemicals and a wide variety of inorganic chemicals.	225,000 / 85,000	Rockwell C 43 / 160 Brinell	7.93	1600° F	No	Used extensively in form of cold rolled strip for stampings, springs, etc.—and in the form of wire for woven screens, dipping baskets, etc. Available in bars, forging billets, strip and wire.
INSTRUMENT PARTS	No. 5 (Type 416) C. .10 Cr. 13.50 S. .30	No. 5 machines in automatic screw machines about like SAE 1120. Cutting speeds between 125 and 200 surface feet per minute are common. This stainless resists the corrosive action of mercury, steam, crude oil, sugar solutions, mine water, etc.	164,000 / 80,000	Brinell 351 / 187	7.77	1200° F	Yes	A Free-Machining grade for parts made on automatic screw machines or machined from forgings—such as valve trim, pump shafts, hexagons for nuts, capscrews, and other hexagonal parts. Available in forging billets, bars and wire.
MOLDING and TRIM	No. 6 (Type 430) C. .10 Cr. 17.00	This stainless is extremely ductile for forming, drawing and stamping and lends itself readily to complicated press work. No. 6 resists the same corrosive elements as Carpenter Stainless No. 1—but with a greater factor of safety.	125,000 / 70,000	Rockwell C 25 / 150 Brinell	7.71	1300° F	Yes	Used in the form of cold rolled strip for making stampings, etc. In the form of cold drawn wire for woven screens, screws, bolts, rivets, and other cold headed products. Available in bars, forging billets, strip and wire.
SCREW MACHINE PARTS	No. 8 (Type 303) C. .10 Cr. 18.00 Ni. 8.00 Se. .25	When machining is involved, this stainless is generally used instead of No. 4. This type provides the same general corrosion resistance properties, and is Free-Machining.	150,000 / 85,000	Rockwell C 35 / 160 Brinell	7.93	1600° F	No	A Free-Machining grade for use in automatic screw machines or forgings to be machined. Recommended for parts requiring greater corrosion resistance than Carpenter Stainless No. 5. Available in same forms as No. 6.

NOTE: Physical properties depend upon form, heat treatment or cold working. Slightly wider ranges of properties are possible in certain forms. Take up your special problems with our Metallurgical Department.

For further design-engineering and fabricating information, ask for a copy of "Working Data for Carpenter Stainless Steels". This 98-page book is made available to help you select the best Stainless for today's or tomorrow's products. A note on your company letterhead will start your copy on its way. Drop us a line today.

THE CARPENTER STEEL COMPANY • 121 BERN ST., READING, PA.

Carpenter STAINLESS STEELS

Washington . . .

L. W. MOFFETT

• War Frauds Unit, with 125 attorneys, is investigating 900 cases currently . . . Bribery, conspiracy, false claim and defective material laws cover most of the cases, although WFU operates under 20 principal statutes.

WASHINGTON — Uncle Sam has a number of "watchdogs." One of them is the War Frauds Unit of the Department of Justice whose duty it is to prosecute war contractors who violate Federal criminal statutes.

The Frauds Unit, which is headed up by Assistant Attorney General Thomas C. Clark, has had nearly 3000 complaints in the past year. Mr. Clark says that about 10 per cent of the complaints lead to prosecutions. Approximately 900 war fraud cases are under investigation; slightly more than 100 cases are in court and about 60 have been successfully prosecuted.

While the WFU operates under more than 20 principal statutes, there are four under which most cases are falling. They are: Bribery, conspiracy, false claim and defective material statutes.

Among defendants who have been fined or sentenced to imprisonment are corporations, their executives, government employees, union officers and members of the military establishment.

The government has been the loser of millions of dollars, but WFU is seeking to prevent further losses through vigorous prosecution.

THERE are 125 attorneys in WFU who conduct preliminary investigations, prepare the cases and prosecute them. John Darsey is acting chief of the unit. The Federal Bureau of Investigation has set up a War Frauds Section within the Bureau, and FBI field offices now have special War Frauds Units.

The War and Navy Departments and also the Price Adjustment Boards, are referring all complaints received by them to WFU. Lt. Col. Herbert Friedlich channels information about possible violations in connection with Army contracts to WFU. His opposite number in the Navy is Charles Ditmar in the office of the Undersecretary. The Maritime Commission has not as yet established similar machinery.

Anonymous letters frequently form the basis of a routine check by FBI. Mr. Clark said that the practice is to phone or telegraph the information contained in such letters to the FBI field offices for investigation.

An illustration of what may happen when business strays from the straight and narrow is the case of the Sullivan Drydock & Repair Corp., Brooklyn, N. Y. The Sullivan Corp.'s president and vice-president, Anthony McAllister and Herbert Krauss, according to Department of Justice records, were sentenced to two years imprisonment and fined $5,000 each; the company's treasurer, Walter Krauss, and two other employees, William Watson and Leslie H. Finlay, drew jail sentences of nine months; the company was also fined $5,000. All defendants plead guilty.

THE Sullivan Corp. was said to have had a cost-plus contract with the government for the repair and construction of ships. Salaries of officers and employees were increased several hundred per cent on the books, it was said, but actually the money was kicked-back to the company. Mr. Darsey says that the false claims which the company made were proved to be in excess of $100,000.

WFU says it stopped a racket of two scrap dealers with the Raritan Arsenal, N. J. Justice estimates the loot was more than $50,000. Caught were Samuel Byer and Israel Citron who were said to have bribed a Quartermaster sergeant to falsify bills of lading, property passes and to short-weight brass and copper scrap for them.

Messers. Byer and Citron were reported convicted of a conspiracy to defraud the United States. Mr. Byer was sentenced to two years in the penitentiary and was fined $5,000. Mr. Citron got a year and a day, and was fined $7,500. The sergeant, who accepted $900 as a bribe, was subject to military law, and was not within the court's jurisdiction.

FIRE-POWER: This Emerson electric turret raises the B-24's .50-caliber armament to thirteen guns.

The government says it collected $77,500 in fines when it convicted the Rockbestos Products Corp. and eight other companies of a conspiracy to defraud the United States. The companies, it is said, had contracts to furnish the Army and Navy with AVC cable and all submitted identical bids which the government said were collusive and it was charged also that the prices were unreasonably high.

Rockbestos is declared to be the owner of the patent rights on the cable and under its patent was per-

"Ramix-land" at War

In more than a hundred open hearths, steel is being made on Ramix bottoms. They represent better than 12% of the basic open hearth steel capacity of America.

Since the first rammed sub-hearth was installed in a southern 150-ton furnace in March, 1940, an average of three Ramix hearths have been put in every month. They range in size from small 20-ton jobs in steel foundries to the largest. More than a dozen are in 200-ton furnaces of ultra-modern design. They are located in every important steel producing center.

Not only does every Ramix hearth installed save several days of construction—making possible 10 to 15 additional heats of steel in the time saved, Ramix also makes a clean, slag-resistant bottom that requires a minimum of maintenance and repair. Delay time is reduced, furnace output per manhour is increased, steel poured is cleaner, and quality better.

Experienced Basic Engineers are at your service to supervise the installation of Ramix bottoms. Let us know when you have a hearth job to be done.

BASIC REFRACTORIES, INCORPORATED

CLEVELAND, OHIO

mitted to license its manufacture and control prices in peacetime. Contrary to agreement, Mr. Darsey said, the companies exercised the right to control prices. He reported the eight other companies on a nolo contendere plea were fined $10,000 each. Mr. Darsey said that civil recovery in the case would run into many millions.

Four business agents for a local New York union which had a closed shop on an Army project at Vorheesville decided that since they had a closed shop, but could not furnish all the labor required on the project, they would issue work permits. The work permits cost $3 a day and before the defendants, Thomas F. McGraw, John McGraw, George J. Mannl and Jacob Betar, got stopped by WFU they had collected in excess of $90,000 from non-union laborers. Fines of $10,000 each were imposed for violation of the "Kick-back Racket Act."

Ferdinand J. Herman was in charge of salvage sales at the Army Warehouse at Fort Dix, N. J. In the warehouse were four grades of material. A material was first grade. B goods were used but could be reused. C stocks had to be repaired. The merchandise in D grade could be sold as salvage.

It is said Mr. Herman and two other defendants, Benjamin Gedinsky and Hyman Kaplan, dealers thought it would be a good idea to mix first class merchandise in the salvage sales to Gedinsky and Kaplan. It is reported that the warehouse was cleaned at more than a $50,000 loss. And while all this was happening a Quartermaster Corps major was induced to get drunk, according to Justice records. The major had charge of the warehouse and he was not around when the "sale" occurred.

Upon conviction by jury, Mr. Herman and Mr. Gedinsky were sentenced to a year and a day in prison and fined $2,500 each. Upon a plea of guilty, Mr. Kaplan was sentenced to a year and a day and fined $5,000. However, each of the prison sentences was suspended and the defendants were placed on probation.

o o o

General Motors Gets DPC O.K. to Buy More Equipment

Washington

• • • **Defense Plant Corp.,** RFC subsidiary, has authorized the following contracts:

General Motors Corp., Detroit, to provide additional equipment at plants in Ohio at a cost in excess of $4,000,000, making a total commitment of more than $22,000,000.

Tantalum Defense Corp., Chicago, to provide additional plant facilities in Illinois at a cost in excess of $1,100,000, making a total commitment of more than $5,350,000.

Publicker Commercial Alcohol Co., Philadelphia, to provide additional facilities at a plant in Pennsylvania at a cost in excess of $750,000, making a total commitment of more than $5,300,000.

Meisel Press Mfg. Co., Boston, to provide additional facilities at a plant in Massachusetts at a cost in excess of $150,000, making a total commitment of more than $1,430,000.

Edo Aircraft Corp., College Point, N. Y., to provide additional plant facilities in New York, at a cost in excess of $100,000, making a total commitment of more than $1,175,000.

Republic Steel Corp., Cleveland, to provide additional plant facilities in Ohio at a cost in excess of $540,000, making a total commitment of more than $965,000.

Paramount Mfg. Co., Inc., Hillsdale, Mich., to provide additional machinery and equipment at a plant in Michigan at a cost in excess of $50,000, making a total commitment of more than $500,000.

Old Clover Distilling Co., Tunkhannock, Pa., to provide equipment at a plant in Pennsylvania at a cost in excess of $20,000.

ODT Provides More Cars

• • • **The Office of Defense Transportation** has found it possible to provide for the construction of an additional 5,801 new freight cars in 1943 out of steel allocated to the railroad industry for the third quarter. The addition of the 5,801 new cars to the approximately 26,000 already authorized will mean that upwards of 32,000 new freight cars will be produced this year, ODT officials declared.

The breakdown of these cars according to type is as follows: Box, 2,724; gondola, 262; hopper, 2,150; refrigerator, 300; flat, 365.

The list of builders and the number of units each will build is set out below:

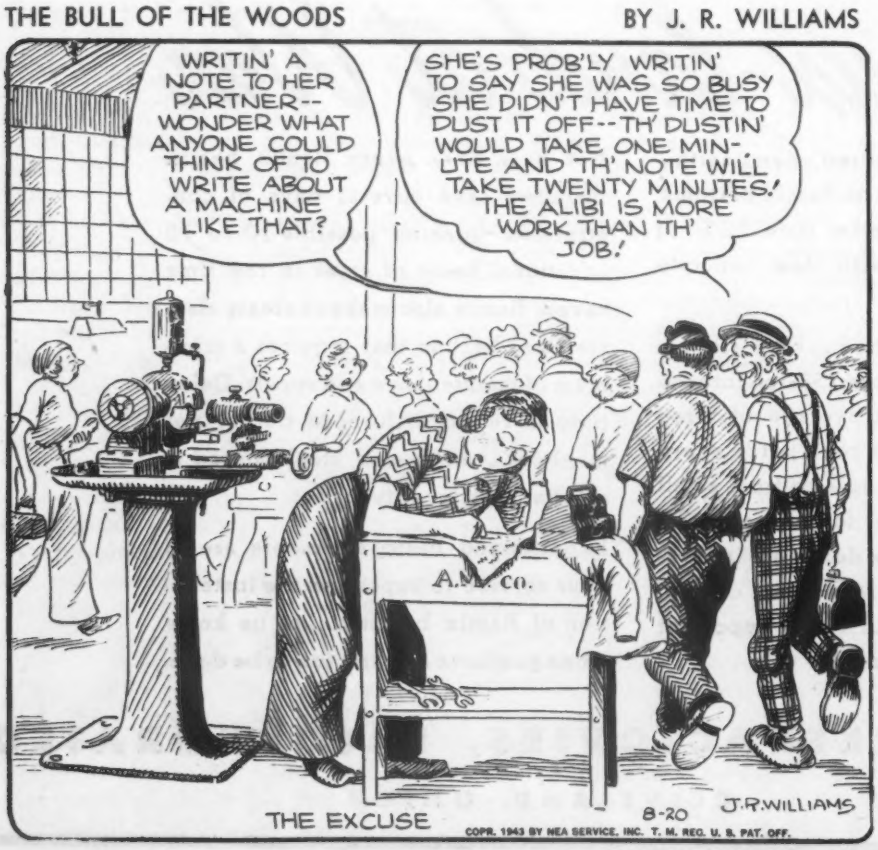
American Car & Foundry, 1402; Bethlehem Steel, 500; Fruit Growers Express, 300; General American Tank Car Co., 1100; Greenville Steel Car Co., 165; Mather Stock Car Co., 62; Mount Vernon Car Mfg. Co., 200; Pullman Standard Mfg. Co., 1092; Chicago, Milwaukee, St. Paul & Pacific Shops, 300; Chicago, Burlington & Quincy Shops, 330; Reading Shops, 200; and St. Louis Southwestern Shops, 150.

90% Advance Made Upon "Zero Quota" Output of Mines

Washington

• • • **Effective with** August deliveries, operators of domestic "zero quota" copper, lead and zinc mines may obtain from smelters and mills, as agents of the Metals Reserve Co., an advance of 90 per cent of the premiums payable on their production in addition to the base price for ore or ore concentrates. In making this announcement Secretary of Commerce Jesse Jones said that full details will be furnished interested parties by these agents.

THE BULL OF THE WOODS — BY J. R. WILLIAMS


WRITIN' A NOTE TO HER PARTNER-- WONDER WHAT ANYONE COULD THINK OF TO WRITE ABOUT A MACHINE LIKE THAT?
SHE'S PROB'LY WRITIN' TO SAY SHE WAS SO BUSY SHE DIDN'T HAVE TIME TO DUST IT OFF--TH' DUSTIN' WOULD TAKE ONE MINUTE AND TH' NOTE WILL TAKE TWENTY MINUTES. THE ALIBI IS MORE WORK THAN TH' JOB!
A.M. CO.
THE EXCUSE
8-20
J.R.WILLIAMS
COPR. 1943 BY NEA SERVICE, INC. T. M. REG. U. S. PAT. OFF.

"SPARE GUN PARTS HAVE GOT TO FIT —OR ELSE"

OFFICIAL PHOTOGRAPH, U. S. ARMY AIR FORCES

Any gun not in condition to fire is a liability to our soldiers at the front. When any gun element fails, or wears to a point where it is no longer dependable, it must be replaced immediately for every gun must be kept in service.

To do that, replacement parts must fit perfectly. The only way to assure proper fit (interchangeability) is to control all critical dimensions of every part with reliable gages *before these parts are sent overseas.* Our armed forces have neither the time nor the facilities in the field to correct dimensional errors in replacement parts.

★ ★ ★

Sheffield's specialists in dimensional control are authorities on interchangeable manufacturing. Write for folder No. 43-1.

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MASTER GAGEMAKERS

THE SHEFFIELD CORPORATION

Dayton, Ohio, U.S.A.

AUTHORITIES IN DIMENSIONAL CONTROL

WEST COAST . . . OSGOOD MURDOCK

• OPA feels its own lash as federal judge backs scrap trade whipping boys . . . Coast aircraft plants hire twelve to gain one . . . Army prepares to fire statistical salvo in Boeing recruitment campaign.

LOS ANGELES — Those Russian court trials where the defendants break down and confess in full—as if they were getting $10.00 a word from *True Story Magazine*—are all very well to read about, but two OPA attorneys last week found out here that certain precautions must be observed to insure a smooth staging. The defendants must be willing and well coached, and the judge must be sympathetic to the role he is to play.

In the Federal district courtroom of Judge Benjamin Harrison, where OPA was seeking to enjoin Berg Metals Corp. from treading roughly on OPA Price Schedule No. 4 governing sales of iron and steel scrap, the price agency's attorneys failed to ignite a long delayed action fuse, and both the defendant and the judge seemed most successful in blasting the accusations to bits.

Said Judge Harrison, "During my three years on the bench, and previous three years as United States attorney, I am convinced that this is the worst miscarriage of a legitimate Washington order that I have ever seen in court."

Said the OPA attorney, "Your Honor, we are not in the habit of coming to court with trifling violators, but this case is very important."

Said His Honor, "If you had enough appropriations, you would have brought everybody into court."

Thus what might have been a beautiful friendship between a New Deal appointed judge and an alphabetical agency jumped the tracks, and with it went all hope that two principal members of the California scrap industry would serve as contrite whipping boys to demonstrate the might of small type.

BERG METALS CORP. always has turned a deaf ear to OPA's pleadings that it repent for failing to keep records last fall according to the letter of Price Schedule No. 4, for quibbling about the cumbersome remote area pricing schedule then in force, and for other technical violations. The OPA concedes that for the past ten months Berg has been a model citizen as regards the No. 4 regulation, has equipped all its salesmen and bookkeepers with magnifying glasses for the footnotes, and otherwise has washed its business linen with Rinso. But OPA argues that to feel the exhilaration of leading an exemplary existence, Berg should publicly confess its past misdeeds.

Over 400 such injunction suits have been filed throughout the United States and in nearly 5,000 consent decrees have been willingly signed by members of other trades and industries, yet this leader of the California scrap trade refuses to donate its blood to save an OPA regulation stricken on the battlefield! As a matter of fact, it was Berg who took a pot shot at OPA in the first place.

Berg, it should be explained, has long been the strong man of the southern California scrap trade, doing a $6,000,000 annual volume, and operating a non-ferrous secondary smelter which has increased its facilities fivefold since the outbreak of war. It is one of the two firms on the Coast licensed to purchase and melt aluminum scrap. About two thirds of its ferrous scrap business is with Columbia Steel, United States Steel Corp. subsidiary, which purchases about three quarters of its scrap requirements in the abundant southern California market.

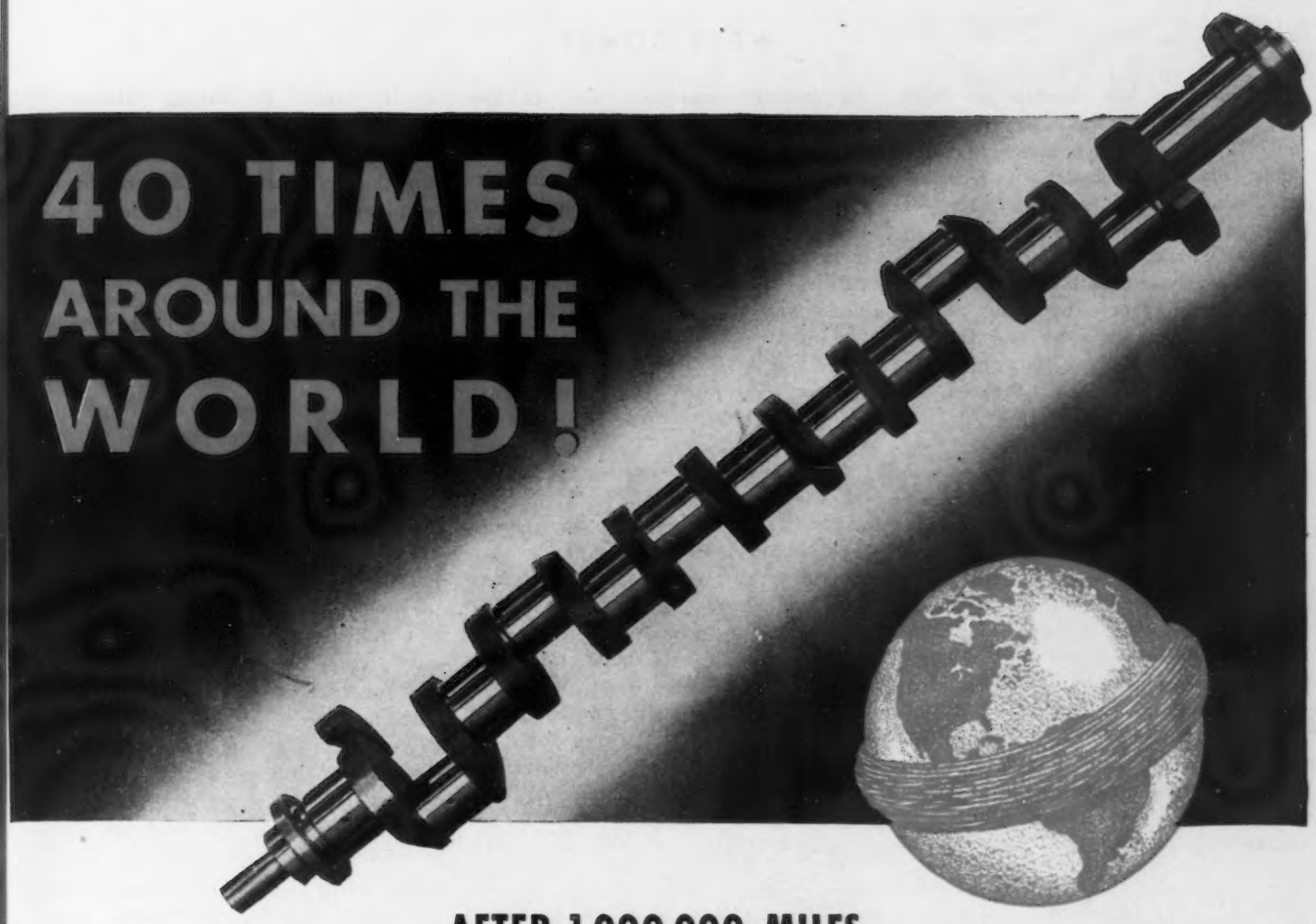
No criminal charges nor civil suit for damages is involved in the current action, and most of the charged violations involve questions of record keeping. The wages of all the sin charged by OPA, if they were ever paid, would not have totalled $1,000. But Berg does not admit any profit or guilt. The company, and the lesser lights of the scrap trade whom Berg's contrition was intended to impress, contend that a consent decree, or willing acceptance of an injunction, would be an admission of guilt, and that it owes nothing to attorneys who inadvertently step in the legalistic chewing gum they have spit out in front of them. In fact, Berg several months ago sought a counter injunction to prevent OPA from destroying its business and good-will, contending that it had complied with all OPA requirements, involving 96,000 individual documents required for its 1942 business alone. In discussing this counter-suit, the court observed that one document per ton of scrap handled was a high average, but disavowed jurisdiction.

IF any Federal agency on the West Coast has been a Peter Bell in the full scope of the Wordsworth definition, it has been OPA. This agency apparently has followed a deliberate practice of selecting a principal firm, minutely checking over transactions and records, and then insisting upon a signature of a consent procedure in order to give notice to the entire trade. If violation has occurred under any of the schedules or provisions, whether unintentional, inconsequential, infrequent or unsubstantial to the OPA, it is a legal primrose to be plucked, and nothing more.

In giving the attorneys 20 days to file briefs, Judge Harrison sadly warned Berg, "If they are going to crucify you for failing to dot an I and cross a T, and if you have failed to dot an I and cross a T, I must issue an injunction. I am helpless. But if I find for the OPA I wish it understood that I believe that none of the violations were willful, but were omissions arising out of the confusion of instituting new methods of keeping records, made necessary by the changing regulations. I believe the defendants acted in good faith."

Selected as the trade's whipping boy for northern California is California Scrap Iron Corp., which occupies a comparable position in the trade in that section. OPA charges this firm with technical violations similar to those involved in the Berg case, none of which has occurred since the fall of 1942.

Although West Coast aircraft plants hired 150,000 employees dur-



AFTER 1,000,000 MILES

TOCCO-HARDENED CRANKSHAFT SHOWS ONLY 1/1000-INCH WEAR!

ONLY 1/1000-inch wear on the crankpins after piling up a service of 1,000,000 miles . . . a distance equal to 40 times around the world! That's the record of one veteran TOCCO-hardened crankshaft on one of the country's fastest streamliner trains. Hundreds of thousands of other TOCCO-hardened crankshafts are giving similar performance . . . giving 5 to 10 times normal life . . . avoiding delays for engine overhauls . . . keeping engines of the United Nations on the straight path to Victory.

TOCCO-hardened crankshafts are used by the firms listed.

Investigate TOCCO for improved and faster hardening, annealing, brazing and heating.

THE OHIO CRANKSHAFT COMPANY
Cleveland, Ohio

THESE ENGINE BUILDERS USE *TOCCO*-HARDENED CRANKSHAFTS

Caterpillar Tractor Co.

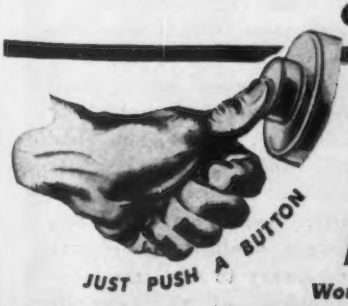
Cummins Engine Company

General Motors Corp.
Seven divisions making trucks and diesel engines.

Hercules Motor Corp.

International Harvester Co.

White Motor Company
and many others.



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World's Fastest, Most Accurate Heat-Treating Process

HARDENING
ANNEALING
BRAZING
HEATING for forming and forging

ing the first six months of 1943, the net gain to their payrolls was only 12,000. J. H. Kindelberger, president of North American Aviation Inc., places the current shortage for these Coast plant manufacturers at 20,000 workers. To meet current schedules, these plants had to increase their working force by about 36,000 employees between June and December, 1943. Out of every 100 employees, 63 are either women, 4-F men, or men over 38.

Because the Coast plants are fortunately the largest employers of women in American war industry, a given percentage depletion of male working force falls with greatest impact on plants with the highest percentage of women. Numerically, revision in Selective Service manning table regulations make only 58,000 Coast aircraft workers vulnerable to induction—about two per cent of the total reported armed service requirements between now and June 30, 1944. But this 58,000 includes 37 per cent of the Coast aircraft industry's engineering personnel, 24 per cent of its tooling employees, and 23 per cent of its inspection force.

These figures, quoted by Kindelberger as representative of the Aircraft War Production Council which represents the principal Coast plants, were given before the House Military Affairs Sub-Committee on Manpower. These statistics form the basis of a two months blanket draft deferment now in effect for all production employees of major West Coast aircraft plants which will terminate October 1.

TO Boeing at Seattle, for which the entire Puget Sound community is now attempting to recruit 9,000 workers in order to save war contracts for the area's other industries, the figures have special significance. If the turnover ratio holds true, in order to gain 9,000 employees by Christmas, Boeing must hire about 108,000 persons which is a pretty big chunk of the entire working force of the community. As a matter of fact, Boeing's turnover has amounted to between five and six per cent a month, roughly the national average in aircraft plants. To Boeing, "turnover" means exactly that. One fourth of all employees hired by the company during the first half of 1943 were former employees returning to the fold. Two out of every three of these prodigals were women. Sixty-five per cent of the workers who left Boeing during the period were women, 60.2 per cent of whom gave personal reasons for leaving: 12.3 per cent because their family was moving; 10.5 per cent because of illness in the family; 7.4 per cent because they were needed at home by their children; 6.6 per cent because of marriage or maternity; 6.6 per cent because of "domestic problems"; only 3.6 per cent because of inadequate housing or transportation difficulties. Boeing employees who gave "other employment" as the reason for leaving their jobs, including both men and women, amounted to 13.5 per cent of all resignations for the period, and military service accounted for 11.4 per cent of all resignations and 29.5 per cent of male departures.

The 9,000 new workers which Boeing wants are for its Seattle plant only. Its suburban Renton plant needs at least 2,000 in addition.

These figures, according to a message to the Seattle Chamber of Commerce from Under Secretary of War Robert E. Patterson, mean that unless Boeing is successful in recruiting 9,000 workers, withdrawal of war contracts from other manufacturers in the vicinity, now being held in abeyance pending outcome of the recruitment campaign, will be resumed. Renewals will not be given as the smaller contracts expire, in the belief that pressure on the labor supply in the area can be relieved. Seattle people do not concede that spreading misery among the smaller manufacturers would help Boeing, but apparently Seattle has a good chance of becoming one more victim of long distance juggling of statistics by the War Department. It was the War Department which engineered the gold mine closing fiasco which was supposed to be the answer to the labor problems of the copper mines. Last week the Army started the release of 4500 men to man copper, zinc, and molybdenum mines, the second such release made to these mines within the past year. Some Pacific Coasters feel that some similar action may finally be necessary to solve the labor shortage problem of the aircraft plants.

. . . Cited for Awards . . .

• • • **The companies** listed below have been awarded the Army-Navy "E" for excellence in war production.

Thompson Products, Inc., plants at Cleveland, Euclid, Ohio, and Bell, Cal.

Truscon Steel Co., Pressed Steel Division, Cleveland.

Austin Road Co., Galveston Air Field Construction Project, Galveston, Tex.

J. A. Terteling & Sons, Mountain Home Air Base Construction Project, Mountain Home, Idaho.

Taylor Instrument Co., Rochester, N. Y.

Bethlehem-Hingham Shipyard, Hingham, Mass.

Indian Motorcycle Co., Springfield, Mass.

National Standard Co., Worcester Wire Works Division, Worcester, Mass.

Cannon Electric Development Co., Los Angeles.

Aluminum Industries, Inc., Cincinnati.

General Electric Co., Plastics Division, Pittsfield, Mass.

N. A. Woodworth Co., Ferndale, Mich. (white star)

Ajax Flexible Coupling Co., Westfield, N. Y.

Brown Instrument Co., Philadelphia.

Westinghouse Electric & Mfg. Co., Meter Division, Pittsburgh.

Maritime Commission "M"

Walter Butler Shipbuilders, Inc., St. Paul.

Moore Dry Dock Co., Oakland, Cal.

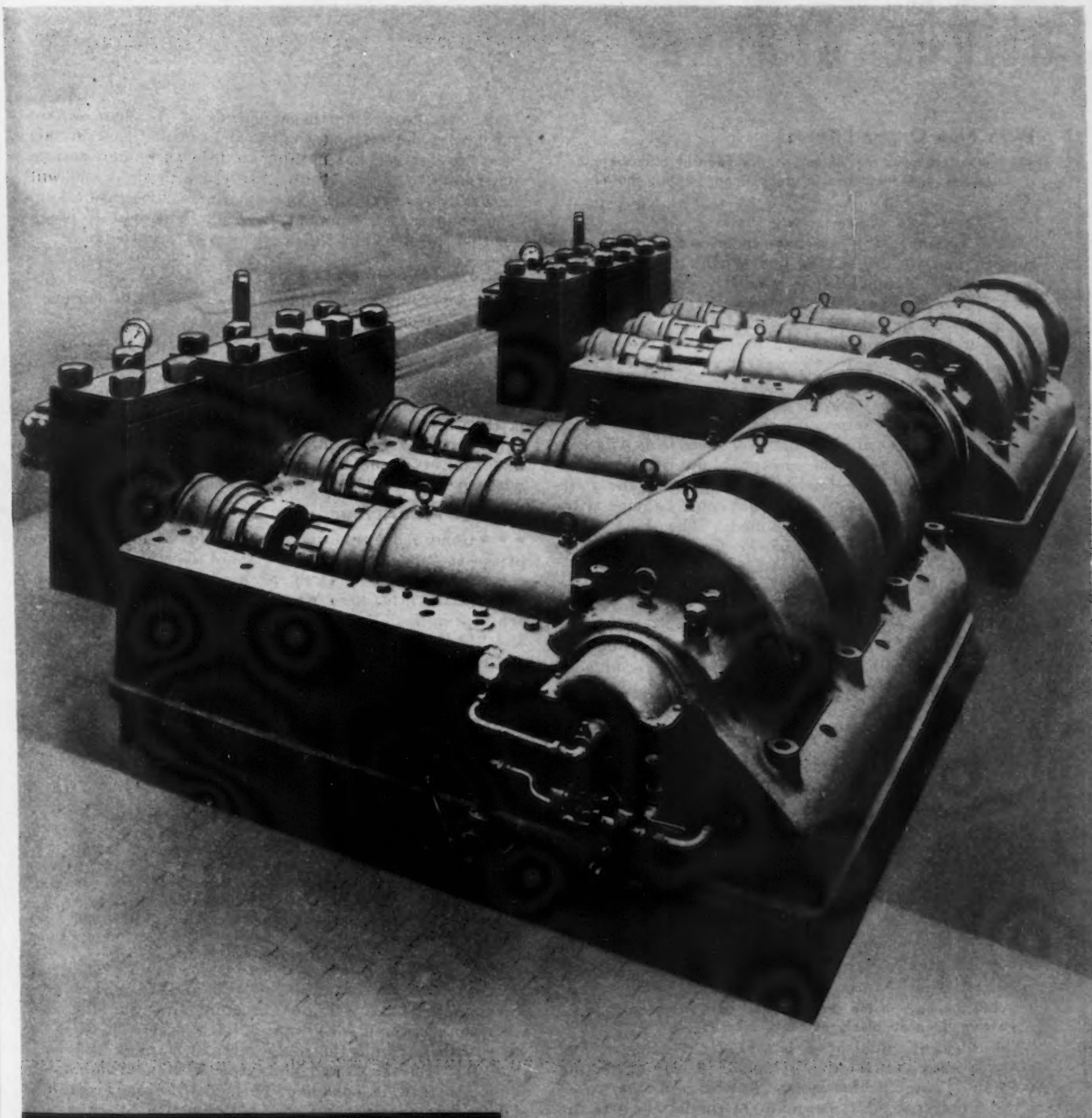
North Carolina Shipbuilding Co., Wilmington, N. C. (merit eagle)

Permanente Shipyard, Richmond, Cal. (merit eagle)

Delta Shipbuilding Co., Inc., New Orleans (gold star)

Houston Shipbuilding Corp., Houston (gold star)

Westinghouse Electric & Mfg. Co., Merchant Marine Division, Philadelphia



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HYDROPRESS · INC.

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HYDRAULIC PRESSES · ROLLING MILLS
PUMPS · ACCUMULATORS

570 LEXINGTON AVENUE · NEW YORK · N. Y.

Fatigue Cracks

BY A. H. DIX

With Pipe Organ Effects

Who provides the names of the Federal alphabetical bureaus? Is there a special department for this chore?
—E. V. Gammill,
J. A. Werme Steel and Iron Works,
Oklahoma City, Okla.

This is something we have been wondering about ourself, and we are asking our Washington bureau to investigate. Meanwhile we would like to add our admiration to Mr. Gammill's for the imaginative ingenuity displayed in naming the new bureaus. The titles roll over the tonsils with the majesty of the opening bars of Rachmaninoff's *Prelude in F.* Samples:

Office for Emergency Management
Office of Economic Stabilization
Committee for Reciprocity Information
Office of the Coordinator of Inter-American Affairs

Contrast them with the abrupt, blunt titling of former days—*War Department, Post Office, Public Printer, Patent Office.* And think what could be done if the older departments were renamed. The Post Office might emerge as *"Office for the Conveyance of the Printed Word—also Packages Carried."*

The best job could be done on the War Department, which has too long been the victim of unfortunate naming. Semantically it is 4F, and besides its name takes in too much territory, representing as it does in fact only the land half of the services. We recommend *"Department of International Security, U. S. Land Division."*

Unstereotyped Title

• • • Speaking of titles with imagination, the best we have yet seen for a plant service roster is this one we ran across in a New York City plant:

THE MEN OF THE LINCOLN METAL PRODUCTS CO.
WHO ARE NOW USING THE WEAPONS
THEY WROUGHT

Let The Thoughts Be His

• • • We detect a stereotyped note in some of the letters from former employees now in the service that are printed in employee publications. We mean the kind of letters reading:

Tell the boys in the shop to keep on working hard, as we sure do need plenty of those . . .

The idea of publishing letters from soldiers and sailors is excellent, for this is the surest way of making the man at the machine realize he also is in the war—at the supply end. But too many of the letters give the impression that the soldier received a request to "please write us something like the attached, so we can run it in the plant newspaper."

If spontaneity is lacking, so is credibility, even though the letter came straight from Munda or Cape Orlando, and the effect produced may be reverse of that intended. As a matter of fact, the simple recital of dangers and hardships, in the soldier's own language, may result in the goal of higher production being reached faster than if the head-on approach is used.

Aptronym

The Assistant Chief Signal Officer of the Army is Major General James A. Code, Jr.
—R. McClure,
Precision Castings Co., Syracuse, N. Y.

Contradiction

• • • In a recent issue of your favorite family journal we read:

In working magnesium, great care must be taken to avoid preferred orientation . . .

This puzzled us, as it seemed incongruous that anything preferred should be avoided. So we took the 53 steps over to the northeast corner of the floor, where the brains department reigns, and learned that in this case "preferred" has nothing to do with human desires but refers to the crystalline structure the material will naturally assume unless preventive measures are taken. The chances are you already know this, but it plugs another pinprick in the sieve of our knowledge.

Once a Title of High Estate

• • • Something else that puzzles us is this sentence in a recent obit:

Throughout the history of the company, he served as its treasurer and clerk.

We judge from this that "clerk" is or was until recently a corporate title of no little dignity. Our guess is that it was imported from England, and flourished chiefly in New England, but we have never seen it used in a letter from the mother country, and wonder whether it is still used there or here.

Job for MacArthur

• • • General Eisenhower's request for a slogan appropriate to "the Allied occupation of North Africa and subsequent events" has so far produced nothing better than "Lafayette, here we are again," "Lafayette, we are here again," and "Here we come again, Lafayette!" and "Lafayette, we return."

The original never seemed to us to be any more potent than the punch served at the Christian Endeavor's annual binge at Ocean Grove, so a refill would be even worse. We are for turning the entire matter over to General MacArthur, whose least utterance is pure poetry, and who could certainly dash off a dozen gems in as many minutes.

That Upstart, John Williams

I cannot commiserate with you because farmers occasionally pester you for Iron Age machines and repairs. Alongside the Iron Age line of farm tools The Iron Age magazine, with all its whiskers, is a parvenu. The Iron Age farm tool business was established in 1836 by Stephen Bateman and has been carried on by four generations of the Batemans up to this time.
—E. J. Baker, Jr., Editor
Farm Implement News, Chicago

We are sorry to hear this, as we had always pictured our founder, John Williams, as going into the silences for seven days and seven nights, in Middletown, N. Y., your favorite family journal's birthplace, back in 1855, shouting "Eureka!" and emerging with a brand new name. Instead, it looks as if he copied it from a potato planter or else got it out of the dictionary.

We are also sorry to admit that the Batemans are a hardier race than the Williamses. There hasn't been a Williams around the place for as long as we can remember. No whiskers either.

Puzzles

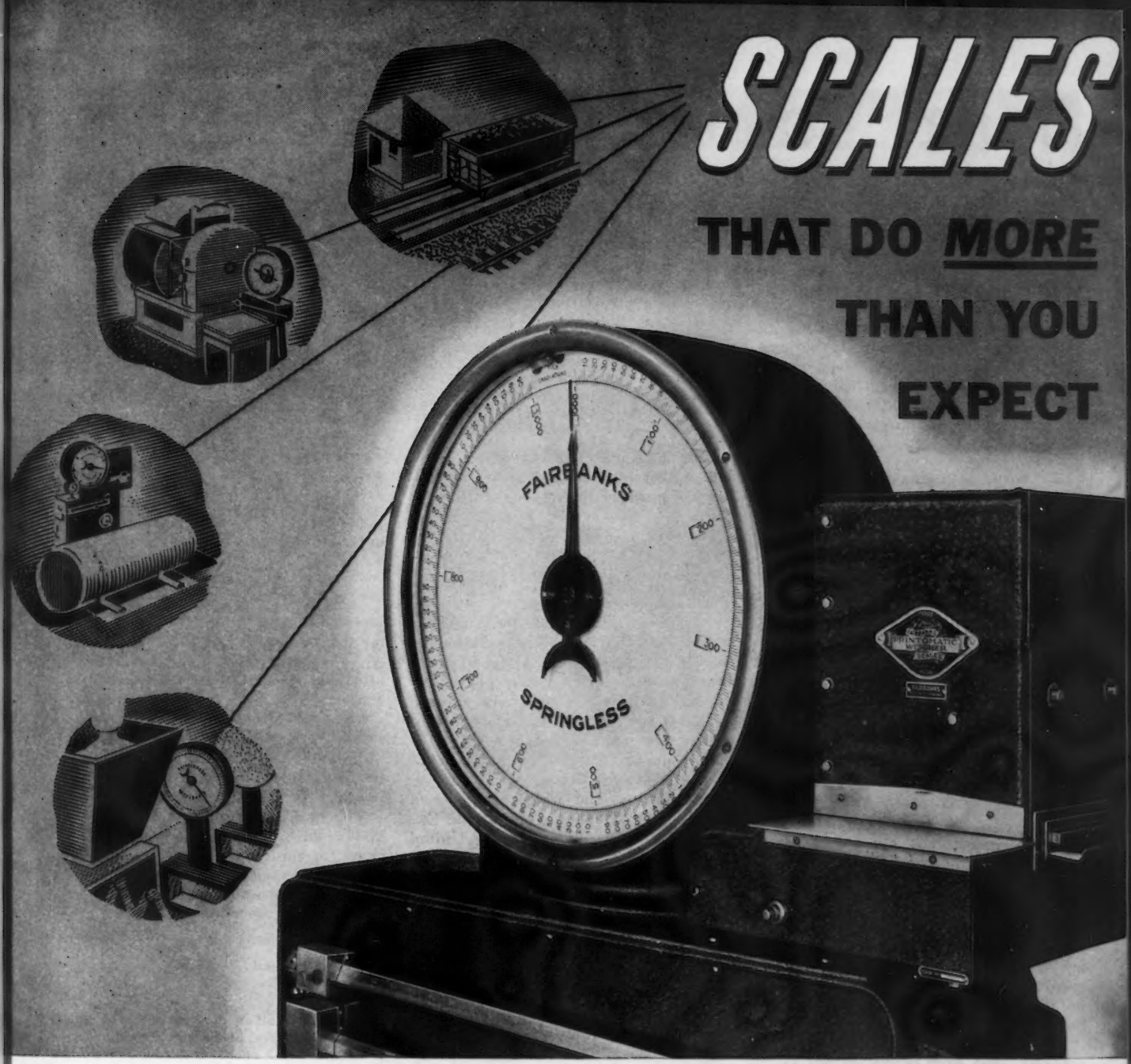
Last week's pieces of eight totaled 1021.

Ed (Chris-Craft) Pickell, A. (Foster Pump Works) Scala, Harry Peterson, and an anonymous quintette that signs itself "We Five," want the answer to the July 22 mathematical illusion—Three men pay $30 for a hotel suite. The clerk later discovers the price is $25 and gives the bell boy $5 to return. The bell boy keeps $2 and gives each man $1. Thus the men paid $27; the bell boy had $2. The question is, what became of the other $1?

The men paid a net of $27. The $27 included $2 held by the bellboy and $25 paid the hotel. The trick lies in asking the question in such a way that the questionee adds the $2 to $27 instead of subtracting it, as he should. This is the truth, and truth is oftentimes tiresome, so we are continuing to search for the imaginary $1.

Ensign E. P. Cochran, Jr., of the Puget Sound Navy Yard, contributes this:

When lowering a ship from one level to another in the Panama Canal, the gates are closed and the water is let out. Assuming that the change of water per unit of time is a constant for all conditions of water level in the lock, which it is not, which ship would require a longer time to be lowered, a battleship or a destroyer?



OF course, Fairbanks Scales are big, husky, and accurate. You have a right to expect these things in *any* good scale — and particularly of Fairbanks Scales with the world's broadest scale manufacturing experience behind them.

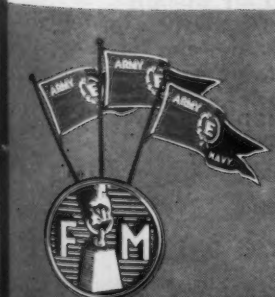
The feature about Fairbanks Scales that may surprise you the most, is their ability to do things you *don't* expect of scales.

Here are a few of many jobs done by Fairbanks Scales:

- They count small parts — more accurately than manual counting
- They weigh carloads of coal in motion and make a printed record of each weight
- They automatically control paint ingredients
- They automatically control aggregates
- They "keep the books" in steel plants, making printed records of incoming and outgoing shipments
- They keep accurate records on chlorination in water treatment
- They record the *flow* of liquid chemicals
- They guard secret formulas in compounding
- They control batching in bakeries
- They prevent disputes by eliminating the human element in weighing.

AND all of these things, only the beginning of the story, they do automatically and mechanically thereby eliminating human errors.

How Fairbanks Scales can be fitted into your production flow to speed up operations and eliminate errors may prove to be the most interesting discovery you ever made. Investigate now. Write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago, Illinois.



FAIRBANKS-MORSE

DIESEL ENGINES
PUMPS
MOTORS
GENERATORS
SCALES

WATER SYSTEMS
FARM EQUIPMENT
STOKERS
AIR CONDITIONERS
RAILROAD EQUIPMENT

FAIRBANKS SCALES

Scales

Dear Editor:

DEFECTIVE CASTINGS

Sir:

Has there ever been a series of pictures made showing defective castings and the causes for such defects?

We believe that a chart showing all these pictures mounted on a bulletin board in the inspection department would not only be helpful to the casting inspector but would also eliminate the differences of opinion as to the cause for such defects.

A. V. MARTENS
Pekin Foundry & Mfg. Co.,
Pekin, Ill.

● **We know of no illustrated wall chart of casting defects, but many technical papers have been presented before the American Foundrymen's Assn., containing excellent photographs of defective castings and a discussion of their causes. Harry W. Dietert Co., 9330 Roselawn Ave., Detroit, has been particularly active in this respect.**

Not long ago, The Iron Age published a large wall chart, unillustrated, entitled, "Causes of Gray Iron Castings Defects." Copies are still available, 25c. in stamps.—Ed.

NEW DEAL AND THE FUTURE

Sir:

On page 99 of your August 5 issue, you say:

> *"The danger that the period of transition to peace will never end is made real by the fact that the present administration never rose from the 'emergency of peace' during its entire tenure."*

Your statement is highly ambiguous. The fact is rather that the policy of the administration is a logical result from the emergency of peace as it is applied to the present and post war planning.

The New Deal with many social reforms, such as Social Security, etc., was an emergency when private capital was in a very precarious position during the long crisis. It took Roosevelt and his Brain Trust to pull the country out of its impasse. The plans contemplated for the future might prevent another depression and upheaval after the war.

Many a time I was prompted to write to you regarding your editorial policy which is highly anti-administration. In this respect may I quote the old adage: "those whom the Gods wish to destroy they first make mad (blind)." I believe our president is farsighted and if properly supported our country will come out on top, both internally and with respect to the rest of the world.

JACK KAHN, P.E.,
2132 84th St.,
Brooklyn 14, N. Y.

ADD DERMATITIS PREVENTIVES

Sir:

Your June 10 "Dear Editor" page lists manufacturers of dermatitis preventives.

In addition to the companies you mention, the Prack Laboratories, Inc., 132 W. 21st St., New York 11, is a manufacturer of Practi-Kreme, which has proved to be very successful as a dermatitis preventive.

W. A. CATHER
Michel-Cather, Inc.,
2 Park Ave.,
New York 16

POINTS PAID

Sir:

Our Regional Office in New York has called our attention to the following paragraph in your July 8 issue:

> "WPB, management and labor dines, some 900 strong, at the William Penn Hotel on *filet mignon*. The 11,000 ration points involved would have wrecked the hotel, so OPA coughed them up."

For your information, we wish to advise you that we were solicited by the United States Steel Corp. to grant about 8,000 points for this particular banquet, which we definitely refused to do on the basis that we would not do for one what we could not do for all, although this affair was built up as the "Donald Nelson Banquet."

In addition, the writer telephoned Mr. John A. Stephens, one of the Executive Vice Presidents of the United States Steel Corp., bringing the situation to his attention, and suggested the banquet be made up of unrationed items in the spirit of the times. Mr. Stephens thought this would be a very fine thing to do, but telephoned shortly after that the hotel had progressed too far with the menu to make the change, that the hotel would provide all the points, and that there would be no special grant required.

In view of the above facts, we would respectfully request that, in fairness to OPA, you retract the statement made in your July 8 issue.

ALVIN J. WILLIAMS,
District Director
Office of Price Administration,
201 Fulton Building,
Pittsburgh, Pa.

● **The Iron Age makes a complete retraction, and apologizes for any harm that may have been done by the publication of a statement which we thought was fact at the time our July 8 issue went to press.—Ed.**

RECIPROCATING DRILL

Sir:

Some time ago an article in our favorite weekly described a new method of drilling metal. Unfortunately, my copy of this issue is AWOL. When did it appear?

J. A. STEES
SKF Industries Inc.,
Front St. & Erie Ave.,
Philadelphia, Pa.

● **The Rego-Karweit reciprocating system of drilling was described on page 48 of the June 17 issue. Additional information may be obtained from the Bastian-Blessing Co., 4229 Petersen Ave., Chicago.—Ed.**

SPONGE IRON

Sir:

If you have any available articles in your magazine or pamphlets on sponge iron, will you kindly send such to this library, as a sponge iron plant is opening here and interest is great regarding processes, etc.

ELIZABETH A. GARBER,
Librarian
Carnegie Public Library,
Laramie, Wyoming

● **See issues of Jan. 7, Feb. 4, 11, 25, and June 10, 1943, and July 2, 23, Aug. 6, 13, Sept. 3, Oct. 29, Nov. 19 and Dec. 3, 1942. —Ed.**

FOREIGN PATENTS

Sir:

On page 107 of the July 15 issue, you have a news item on foreign patents. Is a complete list of these titles available?

L. R. McKEAN
Harris Sales Co.,
88-90 E. Baltimore Ave.,
Lansdowne, Pa.

● **Although not complete, our July 8 issue, pages 115-134, lists a considerable number of the patents applying to metals and metal products.—Ed.**

Sir:

I was very much interested to read in your July 8 issue that it is now possible to purchase from the Alien Property Custodian or through your good office various patent specifications for the fee of 10c. I am particularly interested in examining certain specifications, and would appreciate it if you would secure them for me.

W. F. SKLENAR,
Technical Director
Lempco Products, Inc.,
Dunham Road,
Bedford, Ohio

● **Copies of patents may be obtained from the Commissioner of Patents, Washington, D. C., for 10c. each. The Alien Property Custodian, Chicago 3, Ill., will supply classified lists of enemy owned patents for 10c per class, except in the case of nine classes, for which the charge is 25c. each. Applications for license to use a vested patent should be sent to the Office of Alien Property Custodian, Washington, D. C. Fee is $15.—Ed.**

CMP-PRIORITIES GUIDE

Sir:

The writer's position as Priorities Representative brings him in contact with priorities men at various plants throughout the district who are using THE IRON AGE Simplified CMP and Priorities Guide of April 29, 1943.

If you have an extra copy of this issue, I will be pleased to have you mail same direct to my attention, so that when said representatives quote from your guide I can refer to the same subject by having a guide before me.

FRED P. HARVEY,
Priorities Representative
War Department
Army Air Forces
Materiel Center,
Fox Theatre Bldg.,
Detroit, Mich.

Measuring to 1/10,000 gram

- TO MAKE A BETTER SPRING!

★ A prime requisite of precision spring making is the technician's control of the exact composition of the metal used. He must know, for instance, *to one hundredth of one percent,* the amount of carbon present in spring wire, since a very slight excess in carbon content will increase tensile strength at the expense of ductility.

In this analysis for carbon, pure oxygen is passed over a sample gram of white-hot steel chips. The oxygen combines with the carbon present in the steel to form carbon dioxide. This gas is then collected by absorption and weighed—an almost infinitesimal measurement indicating the amount of carbon present.

Such painstaking thoroughness, from the selection of raw stocks to the inspection of the finished product, explains the high performance rating of Muehlhausen Springs.

MUEHLHAUSEN SPRING CORPORATION
Division of Standard Steel Spring Company
817 Michigan Avenue, Logansport, Indiana

SEND FOR TWO NEW FOLDERS—FREE

New Die Spring Bulletin illustrates, describes 206 sizes and types of die springs.

New Armament Bulletin shows importance of springs for many types of war equipment.

MUEHLHAUSEN
MS
SPRINGS
EVERY TYPE AND SIZE

This Industrial Week . . .

- ***August Steel Volume Ahead of July***
- ***CMP Cuts Confusion and Establishes Stability***
- ***Manpower Situation Still No. 1 Problem***
- ***Ingot Rate Remains Unchanged at 98.5***

DESPITE the avalanche of steel orders during the first half of August which with some companies almost reached previous peaks, steel observers this week saw a better balance between supply and demand than has been the case since the war begun. Major credit for such a situation can be laid at the door of the Controlled Materials Plan which is now functioning in far better shape than was the case a few months ago. This success on the home steel front has been made possible because CMP is much better understood by steel customers and there have been less complaints from steel consumers over deliveries and orders.

Steelmakers believe, however, that some of the Claimant Agencies could move faster in getting out allotment numbers. By taking too much time orders often reach steel companies after schedules are well built up. This condition is reflected this week where railroads are finding it difficult to obtain the steel they have been promised. In view of the present tightness of sheets, plates and bars it seems unlikely that the roads will receive the benefits anticipated because of increased allotments in time to help the roads clear up their shortages in cars, locomotives and repair parts this Fall.

Steel order volume which is no longer the criterion it was formerly because of CMP has nevertheless, so far this month, shown a substantial increase over the same period in July. Some districts report increases in new orders over a month ago ranging from 10 to 30 per cent. Although this past week reflected a slight drop in new bookings over a week ago, this is not held significant since the two previous weeks were record periods for some companies. As a result of this activity steel backlogs are quite heavy and practically all mills are booked up for the rest of this year on all products except a few.

SOME companies are reporting first quarter schedules closing rapidly on the more important items such as plates, sheets and bars. One advantage of CMP over the old Priorities System is that even though customers place their orders well ahead of time they have a reasonable assurance that they will obtain delivery when specified. Thus, in the past few months, confusion has practically left the steel picture. One notable factor in steel bookings during the past three weeks is the care of steel consumers to comply with the 60-day inventory restriction set up by WPB. This has resulted in a substantial number of orders being set back, and such action could easily be misinterpreted as a cancellation. However, in such cases another order is usually placed for identical items slated for delivery at a later date.

Steel mills recently have been able to gain considerable headway in cleaning up carryovers. This has been realized through the cancellation of some items which have been set further ahead on steel schedules. Nevertheless many companies are still plagued with the tremendous job of paring down huge carryovers which mounted rapidly in some areas which were effected by the coal strikes.

WHILE the steel industrial front is apparently going along at a much better clip than at any time during the past year and a half there are still a few danger signals ahead which may prevent the full utilization of steel ingot and finishing productive capacity. The manpower situation is no better than it was a week or a month ago and in coming months is expected to be the major problem in the steel industry. Some of the sting may be removed from this irritant by the action last week of the War Manpower Commission which issued a critical list of essential occupations, expanded the non-deferrable list and made rules to govern the transfer and migration of workers. The new list of critical occupations is no different from those included in the original 35 essential occupations devised by WMC, but it seeks to give the group name a higher priority on deferment. The WMC also apparently hopes that by cracking down on non-essential occupations it will drive these workers into war work, a movement which was not successful several months ago when the original list was set up. It is now clear that although fathers will stand a chance of being deferred as long as possible this will probably only be the case when such men are in a bonafide essential industry. The WMC hopes that this latest move will help alleviate some of the manpower shortage now existing in practically every war industry.

Another deterrent to higher steel production which has been growing steadily worse in some districts is the supply of coke. But this situation may change in view of the government's intention to increase the coal mining work week from 42 hr. to 48 hr. Early this week it was not indicated when the longer week would be instituted or how many mines it would affect. This decision will be made by Harold Ickes and will, of course, represent higher costs to those companies which operate on a 48 hr. week since it

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is expected that all work over 35 hr. a week will be paid for at time and one-half. Observers expect that this will soften somewhat the demand for higher wages and may end, to some extent, the uncertainty over coal mining operations in the future. Nevertheless, so-called captive mines, owned and operated by steel companies, will again be put on the spot costwise since the steel companies will have to absorb increased labor costs owing to ceilings over steel prices.

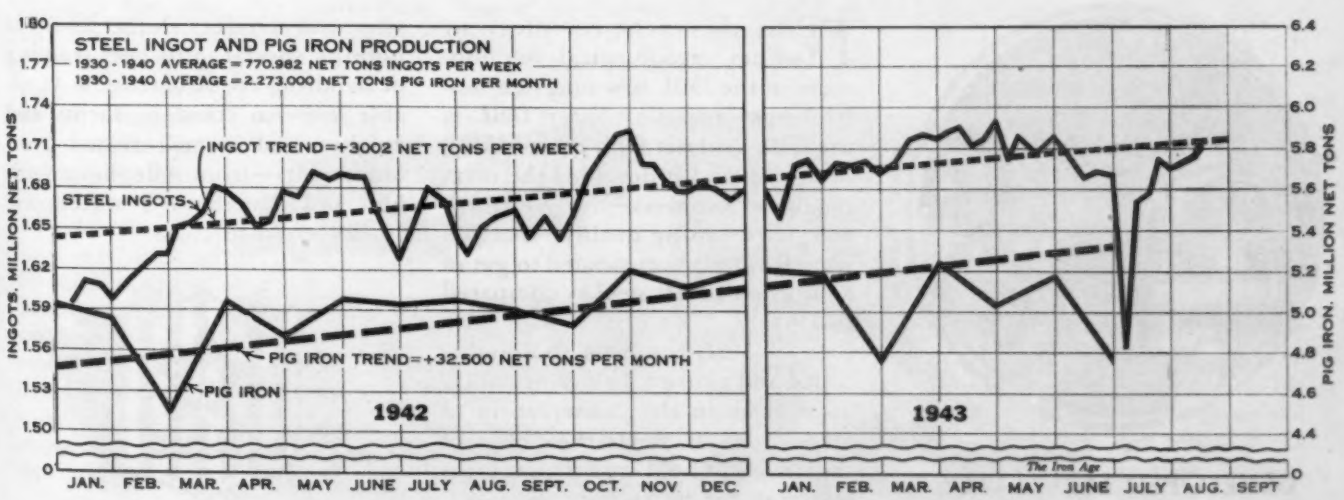
THIS possibility of further increased steel costs brings to attention a number of factors which have steadily reduced the slack between steel costs and selling prices. The heavy volume of steel business has covered up the fact that costs have been rising continuously for sometime. Some of this has been due to increased transportation charges, a decline in output per employee due to the manpower situation and also because of the change in the distribution of steel products where the bulk may be an item on which the least money is made. The OPA has consistently turned a deaf ear to talk concerning increased steel prices on the basis that steel company financial statements could be taken as a criterion rather than individual steel products. As long as earnings statements indicate a fairly good overall condition there is probably no chance of a change in the steel price setup. However, factors which have been building up for months towards higher steelmaking costs have not become so numerous and potent that it would not be surprising to see the whole steel price question opened up sometime this year.

Bad weather and accidents to ore boats has made necessary the pooling of shipping resources of the Great Lakes shippers handling iron ore this season. The effect of the plan will be to build up mill stocks of ore at all plants depending on lake ores to the point where there will be no curtailment of operations during the late winter months due to ore shortages. The project will require the shifting around of ore boats and when the stocks of one company have been built up to estimated requirements these carriers will be utilized for other companies who have not yet reached their quota.

The Steel for Victory Program continues to skip along merrily with the third quarter quota already met. According to Highland G. Batcheller, WPB vice chairman, more than 110,000 tons of steel for the campaign was obtained through increasing steel ingot production. This tonnage, Mr. Batcheller said, was obtained despite hot weather, strikes, and so forth during the first month of the drive. This steel plus 265,000 tons obtained through the "Share-the-Steel" section caused the drive to realize 376,000 tons of steel in July against a quota of 333,000 tons.

THIS week and last week WPB was widening its efforts to supply steel for essential civilian uses such as farms, agricultural implements, warehouses and railroads. Whether the pronouncements on paper will mean that these consumers will obtain the steel promised them remains to be seen. Nevertheless, the intent to bolster up the home economy and prevent breakdowns in essential services will probably be successful to some extent out of the sheer necessity

West Coast aircraft plants are having their headaches in obtaining new employees. During the first six months of 1943 these plants hired 150,000 employees in order to show a net gain to their payroll of 12,000. According to J. H. Kindelberger, North American Aviation president, the current shortage of these coast plane manufacturers is approximately 20,000 workers. Out of every hundred employees at the present time 63 are either women, 4-F men, or men over 38. The revision in the Selective Service Manning Table regulations, it is said, makes only 58,000 coast aircraft workers subject to induction. However, because the coast plants are the largest employers of women, this 58,000, it is said, includes 37 per cent of the coast aircraft industry's engineering personnel, 24 per cent of its tooling employees, and 23 per cent of its inspection force. These figures by Mr. Kindelberger are a concrete example of what will happen in a greater or less degree to practically all war industries during the next six months.



Steel Ingot Production by Districts and Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
August 12	102.5	99.0	97.0	93.0	96.5	100.0	90.0	98.5	102.5	102.0	98.0	99.0	89.0	98.5
August 19	102.0	99.0	97.0	93.5	98.0	104.5	91.0	98.5	100.0	102.0	98.0	99.0	99.5	98.5

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Late Season, Bad Weather, and Accidents Result in Plan for Pooling of Resources Among Great Lake Shippers to Prevent Ore Shortage in Late Winter Months

Cleveland

• • • **The late** lake shipping season coupled with the bad weather and accidents to ore boats has made necessary a pooling of shipping resources of the Great Lakes shippers handling iron ore this season. The net effect of the plan, which has been worked out with the cooperation of shippers, carriers, and ore consumers, is to build up mill stocks of ore at all plants depending upon lake ores to the point that there will not be any curtailment of operations during the late Winter months for lack of iron ore.

The plan will not necessitate the shuffling around of iron ore after it is shipped downlake, but instead permits the smooth flow of ore by boat either to points of consumption or to closest lake ports where the ore can be most directly transshipped to the specific mill stocks.

The whole plan, purely a voluntary program, is predicated on the basis of where each company will stand in regard to ore stocks as of May 22, 1944, just prior to the opening of lake shipping next year. Quotas for each mill have been worked out so that it is known in advance what Winter ore requirements will be with present facilities and those facilities that will come into production before next Spring. In addition to the actual estimated requirements, of course, will be a cushion of stocks to take care of unexpected emergencies.

This will mean quite a bit of shifting around of ore boats. For example when the stocks of one company have been built up to the estimated requirements, boats in service for that company will go into service for other companies that have not yet achieved their quotas.

At the opening of shipping in 1943, total stocks at Lake Erie ports and at blast furnaces was estimated at 18,496,988 gross tons. However, because of the shortened lake shipping season and numerous accidents that have caused boats to be laid up, the original 104,000,000-ton WPB iron ore quota for 1943 was reduced through several cuts to 86,500,000 tons. This with expanded blast furnace capacity demanding greater tonnages of iron ore may cause a pinch by the end of the Winter months. Consequently, while 86,500,000 tons of ore are expected to be plenty to carry the furnaces over the Winter, this program avoids any chance of curtailment of operations through maldistribution of this vital raw material. Through the scheduling of boats and ore deliveries, this eventually will be circumvented.

o o o

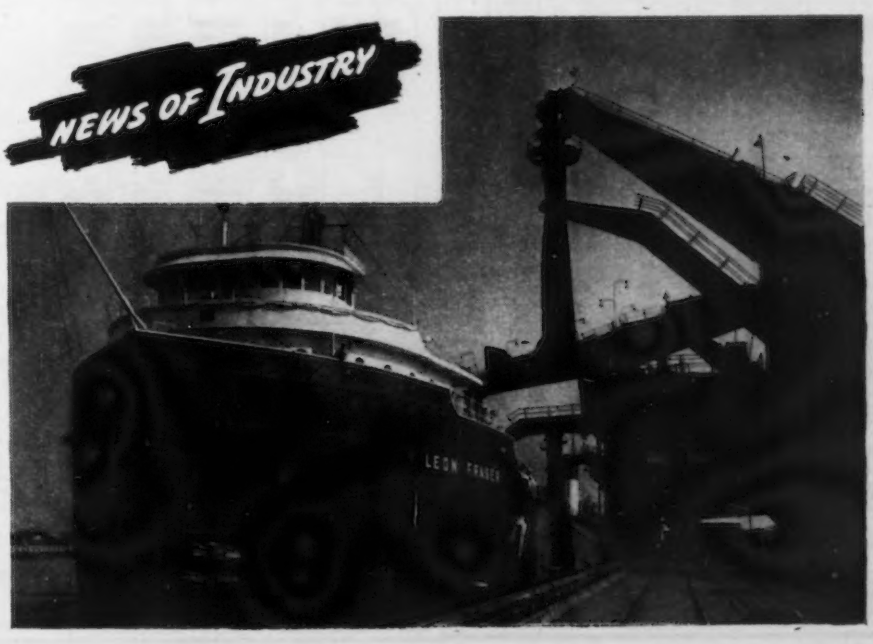
Steel Costs Seen Rising Continuously

Pittsburgh

• • • **An exceedingly** high volume of steel business has, to some extent, covered up the fact that costs in many companies have been rising continuously for sometime. Some of this higher steel making cost has been caused by increased transportation charges, a decline in the output per employee because of new workers and loss of experienced help, and also because of the change in the distribution of steel products where the bulk may be items on which the least money is made.

At the present time the distribution of steel products indicates that semi-finished plates, ordinary sheets, and, to some extent, bars, almost all of which are in the common carbon class, constitute the bulk of present-day sales. A check with some companies shows that since 1939 the costs on some regular items have gone up as much as $3.00 to $6.00 a ton. It is also believed that confidential cost figures at many plants indicate losses on an increasingly large number of items.

The OPA has turned a deaf ear to talk concerning an increase in steel prices on the basis that the overall gross and net return of the company will determine whether or not prices should be raised. There had been many instances where special adjustments have been made, and while there does



not seem to be any immediate prospect of increased pressure for price adjustments there is certainly considerable thinking on the matter.

Probably one factor which has caused some of the thinking stems from postwar possibilities in an industry where competition will be especially keen. Labor rates are the highest in the industry's history, and the output per man has probably declined somewhat due to war conditions. This, of course, all tends to use any slack which might be prevalent because of high volume of business. Then, too, it is argued that in order to produce for victory steel companies have almost as a man gone ahead and accepted much business which showed little or no profit.

When these companies were able to have a substantial tonnage of the more profitable items, the final outcome was fairly well balanced. However, alloy steels are not in as great a demand as they were recently, tin plate production is by no means enormous, and certain other items which have been more profitable are being more than offset by the increase in the distribution to the lower price items.

As long as earning statements indicate a fairly good overall condition, there is probably no chance of any change in steel price setups. The OPA has always considered that by holding down steel prices its job of holding down items made from steel became that much easier. One thing seems certain this week, however—the factors which have been building up for months towards higher steel making costs have now become so numerous and potent that there is not much slack left in the price picture. Whether or not any steel company will step out and ask for a complete readjustment on some of its items remains to be seen. Steel companies have always been reluctant to talk costs, but current conditions have probably made some dent in this reluctance.

o o o

Impact of War Affects Steel Consumption

• • • **War's impact** upon consumers of steel in 1942 is shown vividly in the annual statistical report of the American Iron & Steel Institute for 1942, which made its belated appearance Aug. 13 after hurdling alleged difficulties in the print shop. Shipments to jobbers, stampers, auto and aircraft firms, the railroads and the agricultural implement industry were off sharply from 1941. The construction field took about 500,000 tons more than in 1941, shipbuilding was up close to 7 million net tons, and the so-called "miscellaneous and export" classification, which holds much interest because of what it conceals, jumped upward about 6,000,000 tons.

Examining specific steel products, production of steel plates, of course,

Classifications of Billings of Steel Products by Consumers for 1942 as Reported

Industries	Sheets and Strip				Tool Steel Bars	Wheels and Axles	Forgings	Steel Castings	Skelp	All Other Steel Products	Total Steel Products	Iron and Brass Products	Grand Total	Less Shipments to Members of the Industry for Conversion into Further Finished Products	Net Total	Pig Iron, Ferromanganese, etc	Industries
	Hot Rolled	Cold Reduced	Galvanized	All Other													
	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)	
1. Steel Converting and Processing Industries																	1.
(a) Wire drawers and wire product mfrs.	17,967	2,821			632		77	116		385	864,969	43	865,012	233,724	631,288	13,018	(a)
(b) Bolt, nut and rivet manufacturers	16,358	4,086		491	475		7	8		6,570	1,177,719	4,217	1,181,936	134,519	1,047,417	174	(b)
(c) Forging manufacturers	2,108	210		38	751	41	17,987	520		972	1,317,386	6,489	1,323,875	161,455	1,162,420	6,070	(c)
(d) All other steel plants and foundries	453,694	25,108	3,815	4,022	3,899	542	12,693	19,908	512,390	4,953	4,249,850	51,412	4,301,262	2,849,424	1,451,838	6,923,050	(d)
Total	490,127	32,225	3,815	4,551	5,757	583	30,764	20,552	512,390	12,886	7,609,924	62,161	7,672,085	3,379,122	4,292,963	6,942,312	Total
2. Jobbers, Dealers and Distributors																	2.
(a) Oil and natural gas industry	1,526	97	1,310	4	52		1,444	18		319	284,648	76	284,724		284,724	12,095	(a)
(b) All other	509,343	247,039	281,886	34,021	16,371	157	3,260	390	381	61,731	5,652,961	24,383	5,677,344		5,677,344	71,383	(b)
Total	510,869	247,136	283,196	34,025	16,423	157	4,704	408	381	62,050	5,937,609	24,459	5,962,068		5,962,068	83,478	Total
3. Construction Industry																	3.
(a) Public (Municipal, State, National)	18,490	2,114	32,244	34	244	50	174	23		991	244,208	1,163	245,371		245,371	210	(a)
(b) Highways	18,982	3,386	47,163	82	76	68	44	85		1,482	277,142	17,143	294,285		294,285	89	(b)
(c) Railways	1,828	484	940	188	100		30	14		185	76,164	69	76,233		76,233		(c)
(d) Automotive and Aircraft	161,438	4,378	9,046	162	26	73	55	47		1,505	656,356	1,288	657,644		657,644		(d)
(e) Utilities	12,667	2,546	531	47	42	3,100	841	295		662	422,427	1,048	423,475		423,475	161	(e)
(f) Bldg. trim, accessories and builders' hardware	158,298	53,371	26,869	1,184	18		16	56		2,892	402,955	883	403,838		403,838	7,464	(f)
(g) All other	694,610	69,228	113,464	1,736	547	2,098	2,633	15,873		36,191	6,491,590	67,802	6,559,392		6,559,392	33,798	(g)
Total	1,066,313	135,507	230,257	3,433	1,053	5,389	3,793	16,393		43,908	8,570,842	89,396	8,660,238		8,660,238	41,722	Total
4. Shipbuilding Industry	291,353	24,198	91,864	2,608	1,660	1,111	180,144	30,328		12,621	9,399,406	40,776	9,440,182		9,440,182	7,910	4.
5. Pressing, Forming and Stamping Industry																	5.
(a) Metal furniture and office equipment	94,061	78,831	11,173	2,751	207					15,817	305,480	8	305,488		305,488	168	(a)
(b) Hardware and household equipment	163,199	144,558	24,320	10,736	182	2	4	305		1,773	457,198	9	457,207		457,207	4,199	(b)
(c) All other	767,317	227,790	17,303	18,789	480	643	2,784			12,726	1,954,133		1,954,133		1,954,133	57	(c)
Total	1,024,577	451,179	52,796	32,276	869	645	2,788	305		30,316	2,716,811	17	2,716,828		2,716,828	4,424	Total
6. Container Industry																	6.
(a) Oil and natural gas industry	311,855	56,944	4,634	1,088	283		8			48,590	497,263	71	497,334		497,334		(a)
(b) All other	578,826	194,076	39,900	4,954	116		6,382			22,822	3,168,353	1	3,168,354		3,168,354		(b)
Total	890,681	251,020	44,534	6,042	399		6,390			71,412	3,665,616	72	3,665,688		3,665,688		Total
7. Agricultural, Incl. Impl. & Equip. Mfrs.	134,471	11,722	32,694	4,311	234		2,883	37		4,951	570,046	377	570,423		570,423	64,364	7.
8. Machinery and Tools																	8.
(a) Machinery and tools, not incl. elect. equip.	108,944	34,526	2,491	4,675	31,128	9,425	45,394	45,815		7,504	1,614,838	8,356	1,623,194		1,623,194	26,842	(a)
(b) Electrical machinery and equipment	266,948	75,089	7,391	48,264	1,593	2,213	12,856	2,562		1,825	915,611	773	916,384		916,384	577	(b)
Total	375,892	109,615	9,882	52,939	32,721	11,638	58,250	48,377		9,329	2,530,449	9,129	2,539,578		2,539,578	27,419	Total
9. Automotive and Aircraft Industry	508,778	240,278	11,986	36,122	5,366	535	29,646	485		1,413	2,121,668	198	2,121,866		2,121,866	52,851	9.
10. Railroad Industry																	10.
(a) All railroads	35,730	2,723	17,600	126	717	174,036	4,991	8,579		26,286	3,070,053	18,199	3,088,252		3,088,252	754	(a)
(b) Car and loco. builders and parts mfrs.	96,534	5,342	5,647	742	449	143,939	4,172	5,161		4,498	1,217,177	12,833	1,230,010		1,230,010	30,378	(b)
Total	132,264	8,065	23,247	868	1,166	317,975	9,163	13,740		30,784	4,287,230	31,032	4,318,262		4,318,262	31,132	Total
11. Oil, Natural Gas and Mining Industry																	11.
(a) Oil and natural gas, incl. pipe lines	54,292	4,843	851	30	210		1,248	549		3,931	1,087,439	2,488	1,089,927		1,089,927	14	(a)
(b) Mining, quarrying and lumbering	11,662	512	2,097	437	1,212	2,008	9,675	912		7,489	236,862	1,460	238,322		238,322	176	(b)
Total	65,954	5,355	2,948	467	1,422	2,008	10,923	1,461		11,420	1,324,301	3,948	1,328,249		1,328,249	190	Total
12. Miscellaneous Industries and Export	1,474,850	846,568	212,374	59,659	36,189	63,114	639,983	13,985	170,441	109,249	14,801,673	46,756	14,848,429		14,848,429	416,263	12.
13. Total (Items 1 to 12)	6,966,129	2,362,868	999,593	237,301	103,259	403,155	979,431	146,071	683,212	400,339	63,535,575	308,321	63,843,896	3,379,122	60,464,774	7,672,065	13.
14. Less Shipments to Members of the Industry for Conversion or Resale	320,572	13,487	1,009	2,564	3,378	196	1,852	192	360,820	329	3,339,406	39,716	3,379,122				14.
15. Net Total	6,645,557	2,349,381	998,584	234,737	99,881	402,959	977,579	145,879	322,392	400,010	60,196,169	268,605	60,464,774		60,464,774		15.

showed the biggest gain, jumping close to 6 million tons over the 1941 figure. Semifinished steel showed a gain of around 600,000 net tons in 1942. Rails (over 60 lb.) were up in 1942 by roughly 200,000 tons, and alloy bars gained by about 35,000 tons. Shapes and piling increased by around 360,000 tons over 1941.

Cold finished bars were up about 200,000 tons.

As could only be expected, sheets in 1942 took a nose-dive in production and shipments to consuming industries. The hot rolled sheet total in the accompanying table was about 3 million tons below the 1941 figure; cold rolled sheets were off about 2 million tons, and galvanized sheets were off about 1 million tons. Tin and terne plate showed a decline of about 1 million tons.

On page 104 of this issue, Bureau of Mines statistics covering coke are presented for 1942, and on page 123 iron ore statistics for 1942 by the Bureau of Mines will be found.

Spread Subcontracts to Areas Where Labor Is Plentiful, WPB Urges

Washington

• • • **Because of** the increasing shortage of manpower in certain critical areas, approximately 1000 prime contractors who have backlogs of orders totaling $5,000,000 or more each have been requested to place future subcontracts for fabrication of products in the less critical labor supply areas.

The request to observe this policy was contained in copies of a letter signed by WPB Chairman Nelson; Maritime Commission Chairman Land; Undersecretary of War Patterson; Undersecretary of Navy Forrestal and Clifton Mack, Director of Treasury Procurement Division.

The letter urged prime contractors to follow the same policy in placing subcontracts which the federal government observes in placing prime contracts. For many months the War Department, Navy Department, Maritime Commission and Treasury Department have been making every effort to place contracts in non-critical areas wherever production facilities and the required speed of delivery can be secured in such areas. In the allocation of war work, the procurement agencies rely on the WMC's monthly list of more than 300 labor market areas, classified in four groups according to the adequacy or shortage of labor supply.

C-I Breaks Ten Records

• • • **Ten new production records** were made at Carnegie-Illinois Steel Corp. plants last week. These records included: blast furnace record at Clairton, Pa., works; electric furnace output at Duquesne works, Homestead universal plate mill, and others including electrolytic tinplate output.

by Companies Producing More Than 96 Per Cent of the Year's Output—Net Tons

(Source—Annual Statistical Report of American Iron & Steel Institute)

Industries	Ingots, Blooms, Billets, Slabs, Tube Rounds & Sheet and Tin Bars (1)	Structural Shapes and Sheet Piling (2)	Plates (Universal and Sheared) (3)	Rails: Over 60 lbs. (4)	Rails: All Other (5)	Tie Plates and Track Accessories including Track Spikes (6)	Hot Rolled Bars: Carbon including Hoops and Bands (7)	Hot Rolled Bars: Concrete Reinforcing (8)	Hot Rolled Bars: Alloy (9)	Cold Finished Bars (Carbon and Alloy) (10)	Pipe and Tubes (11)	Wire Rods (12)	Wire and Wire Products including Fence Posts (13)	Black Plate (14)	Tin and Terne Plate (Hot Rolled and Cold Reduced) (15)	Industries
1. Steel Converting and Processing Industries																1.
(a) Wire drawers and wire product mfrs.	56,603	.....	.....	.....	.....	.....	6,748	.....	5,506	2,109	7,328	437,854	326,791	8	24	(a)
(b) Bolt, nut and rivet manufacturers	75,302	.....	1,040	.....	.....	.....	574,965	.....	12,022	59,965	937	271,368	153,765	354	.....	(b)
(c) Forging manufacturers	740,143	165	10,116	.....	.....	.....	261,020	.....	266,342	6,837	3,367	3,722	3,047	.....	.....	(c)
(d) All other steel plants and foundries	1,782,225	25,622	186,063	875	2,925	44,383	820,827	49,875	99,026	7,438	82,604	52,418	53,183	288	1,074	(d)
Total	2,654,273	25,787	197,219	875	2,925	44,383	1,663,560	49,875	382,896	76,349	94,236	765,362	536,786	650	1,098	Total
2. Jobbers, Dealers and Distributors																2.
(a) Oil and natural gas industry	325	1,744	4,209	1	28	.....	4,216	474	1,381	3,675	259,375	92	4,169	.....	189	(a)
(b) All other	38,772	408,964	452,373	7,662	11,198	40,660	680,665	185,995	65,737	204,602	1,374,363	8,760	930,935	67,645	20,051	(b)
Total	39,097	410,708	456,582	7,663	11,226	40,660	684,881	186,469	67,118	208,277	1,633,738	8,852	935,104	67,645	20,240	Total
3. Construction Industry																3.
(a) Public (Municipal, State, National)	194	18,665	21,800	1,492	16	411	6,142	72,754	204	73	42,298	2,344	19,623	2,668	1,160	(a)
(b) Highways	285	60,313	35,555	161	8	29	14,324	75,975	615	70	1,932	272	14,607	1,332	296	(b)
(c) Railways	157	23,136	19,851	542	16	12,678	5,719	5,144	22	20	762	155	3,376	649	168	(c)
(d) Automotive and Aircraft	311	230,377	76,606	575	930	88	43,725	82,050	671	283	16,353	5,015	22,150	289	202	(d)
(e) Utilities	834	102,773	79,820	3,423	5,579	2,322	51,395	76,606	550	223	51,242	5,982	20,879	18	50	(e)
(f) Bldg. trim, accessories and builders' hdw.	426	30,914	32,131	30	448	62	37,486	8,048	267	759	25,758	3,390	16,539	1,401	2,592	(f)
(g) All other	29,417	1,749,129	1,208,772	93,853	21,809	36,642	393,330	1,001,695	3,787	2,931	416,956	21,028	567,754	6,954	1,154	(g)
Total	31,624	2,215,307	1,474,535	100,076	28,806	52,232	552,121	1,322,272	6,116	4,359	555,301	38,186	664,928	13,311	5,622	Total
4. Shipbuilding Industry	76,815	1,667,100	6,064,447	1,811	461	590	504,033	55,395	36,443	34,390	260,072	5,133	56,191	.....	638	4.
5. Pressing, Forming and Stamping Industry																5.
(a) Metal furniture and office equipment	492	1,559	3,253	.....	.....	.....	18,733	.....	56	5,693	12,042	4,437	54,379	1,517	479	(a)
(b) Hardware and household equipment	1,577	1,293	17,053	.....	.....	.....	10,070	.....	1,281	7,993	8,600	425	25,567	29,739	8,521	(b)
(c) All other	36,280	29,576	249,161	.....	.....	.....	217,844	.....	94,139	25,619	53,496	36,556	118,032	25,913	19,685	(c)
Total	38,349	32,428	269,467	.....	.....	.....	246,647	.....	95,476	39,305	74,138	41,418	197,978	57,169	28,685	Total
6. Container Industry																6.
(a) Oil and natural gas industry	328	3,132	16,549	.....	.....	39	2,890	.....	139	78	50	.....	918	22,878	26,860	(a)
(b) All other	88	653	23,177	.....	.....	.....	25,603	.....	175	57	802	1,041	92,291	235,919	1,941,471	(b)
Total	416	3,785	39,726	.....	.....	39	28,493	.....	314	135	852	1,041	93,209	258,797	1,968,331	Total
7. Agricultural, Incl. Impl. & Equip. Mfrs.	29,338	23,614	41,127	99	7	16	208,158	568	13,342	22,765	11,197	1,838	25,627	431	616	7.
8. Machinery and Tools																8.
(a) Machinery and tools, not incl. elect. equip.	79,344	172,754	423,647	2,065	5,061	238	307,544	.....	72,560	128,913	103,097	4,579	24,692	246	196	(a)
(b) Electrical machinery and equipment	4,868	23,046	130,058	112	.....	12	65,713	.....	6,928	22,812	149,324	37,173	55,640	812	372	(b)
Total	84,212	195,800	553,705	2,177	5,061	250	373,257	.....	79,488	151,725	252,421	41,752	80,332	1,058	568	Total
9. Automotive and Aircraft Industry	114,363	73,373	181,739	.....	.....	107	266,580	.....	276,747	207,803	104,438	11,881	46,255	1,004	2,769	9.
10. Railroad Industry																10.
(a) All railroads	55,454	88,156	299,781	1,454,993	7,085	695,451	140,804	269	4,982	1,191	32,686	1,669	16,628	70	46	(a)
(b) Car and loco. builders and parts mfrs.	30,488	226,737	476,052	4,766	221	1,443	172,172	281	10,349	3,314	17,378	2,293	4,726	190	283	(b)
Total	85,942	314,893	775,833	1,459,759	7,306	696,894	312,976	550	15,331	4,505	50,064	3,962	21,354	260	329	Total
11. Oil, Natural Gas and Mining Industry																11.
(a) Oil and natural gas, incl. pipe lines	7,344	59,025	244,991	218	129	66	41,552	3,139	5,191	1,577	648,981	672	7,519	90	991	(a)
(b) Mining, quarrying and lumbering	1,612	13,582	32,004	8,122	51,996	16,602	38,944	1,614	3,679	843	20,324	667	10,821	37	11	(b)
Total	8,956	72,607	276,995	8,340	52,125	16,668	80,496	4,753	8,870	2,420	669,305	1,339	18,340	127	1,002	Total
12. Miscellaneous Industries and Export	3,356,863	264,934	1,423,155	362,369	11,536	65,879	1,139,147	147,499	809,777	853,803	1,030,848	265,879	669,416	91,016	683,140	12.
13. Total (Items 1 to 12)	6,520,248	5,300,336	11,754,530	1,943,109	119,453	917,718	6,060,349	1,767,381	1,791,918	1,605,836	4,736,610	1,186,643	3,345,520	491,468	2,713,038	13.
14. Less Shipments to Members of the Industry for Conversion or Resale	1,588,544	10,174	141,543	286	97	21,335	541,314	1,536	84,143	1,826	20,549	192,388	31,159	35	78	14.
15. Net Total	4,931,704	5,290,162	11,612,987	1,942,883	119,356	896,383	5,519,035	1,765,845	1,707,775	1,604,010	4,716,061	994,255	3,314,361	1491,433	2,712,960	15.

New WMC Move Tightens Deferments, Establishes Transfer and Migration Rules

Washington

• • • **WMC last week issued** a critical list of essential occupations, expanded the nondeferrable list, and made rules to govern the transfer and migration of workers.

The refinement of instructions to local boards with respect to occupational deferment was said to be caused by the necessity for the drafting of fathers after Oct. 1. The new list of critical occupations sets up no different groups other than are included in the original 35 essential occupations devised by WMC, but seeks to give the groups named a higher priority on deferment.

Also, persons having skills named on the list of critical occupations who are not employing them must make themselves available for employment in war industries requiring such workers, or face reclassification and induction. The new rules make it clear that persons on the new critical list may not be hired without a statement of availability by his last employer and a referral or the consent of the United States Employment Service.

Included in the list are the following occupations of interest to iron and steel and other metal working industries:

Aircraft engine mechanic; aircraft engine tester; aircraft instrument mechanic; aircraft mechanic; ballistician; bessemer converter blower; blast furnace blower; boat-building, steel or wood; boring-mill operator; converter operator, nonferrous smelting and refining; coremaker; die maker; die setter; die sinker; open hearth or electric furnace first helper; heat treater; steel mill heater; inspector; machinists; machinists, marine; underground miner; bench or floor molder; paper making machine engineer; steel mill pulpit operator; marine sheet metal worker; ship fitter; shipwright; tool designer; tool maker; metallurgist; physicist.

All current manpower actions have been caused by "scraping the bottom of the barrel" according to WMC Chief Paul V. McNutt and Selective Service Director Louis B. Hershey. Unofficial reports from the government agencies say that the father draft and the tightening up of occupational deferments resulted from the insistence of WPB Chairman Donald M. Nelson that production "lags" in the past two months have been caused by the drafting of too many single men with special skills. Mr. Nelson is reported to have told manpower officials that fathers must be drafted.

Notwithstanding these reports, it is definitely known that this program was devised at least eight weeks ago when THE IRON AGE was told off-the-record by a high WMC official that these actions would be taken on the approximate dates they occurred. For instance, the father draft announcement was placed at Aug. 1, with inductions to begin Oct. 1.

Transfers from one job to another are regulated by local employment stabilization plans. These plans have been established in every part of the country after consultation with local management and labor. Regulation No. 7 sets forth minimum standards to be incorporated in the local employment stabilization plans, to govern the transfer of all workers.

The standards do not become effective in any community until they have been acted upon locally by the WMC area director who must consult with his Management-Labor Committee before making the required changes. Standards are to be incorporated into existing employment stabilization plans by Oct. 15.

Transfer standards are as follows:

A person whose last employment is or was in an essential or locally needed activity shall receive a statement of availability from his employer if:

(1) He has been discharged, or his employment has been otherwise terminated by his employer; (2) He has been laid off for an indefinite period, or for a period of seven or more days; (3) Continuance of his employment would involve undue personal hardship; (4) Employment is or was at a wage or salary or under working conditions below standards established by state or Federal law or regulation; (5) Employment is or was at a wage or salary below a level established or approved by WLB (or other agency authorized to adjust wages or approve adjustments) as warranting adjustment, and the employer has failed to adjust the wage in accordance

Blind War Workers Prove Efficient, Score

Some months ago a survey was made of the operations conducted in the plants of Walter Kidde & Co. to determine their suitability for blind workers. The survey was conducted by Arthur Voorhees, supervisor for the New Jersey State Commission for the Blind. Sightless himself, Mr. Voorhees can operate a wide variety of machines, including a Warner-Swasey turret lathe. Following his recommendations, a group of blind men and women were hired by the Kidde Co., trained in the plant and put to work at various operations including inspection, retapping of faulty valve threads, and several types of assembly, among the regular seeing employees.

The completion of their first six weeks' employment brought forth interesting results. In the first place, it has demonstrated that the productive capacity of the blind is as great

ASSEMBLER: This blind war worker, one of a separate staff of workers in the Walter Kidde & Co. plants uses the dexterity and sensitiveness of the physically handicapped to do highly accurate assembly work. This worker is assembling the hose and horn of the Kidde carbon dioxide fire extinguisher. Note the wire hoop to prevent the flexible hose from swinging into the blind worker's face.

with such level or to apply to the appropriate agency for adjustment or approval.

To control migration, USES referral is necessary, in the case of workers who have not lived or worked in the locality during the preceding 30-day period.

"Workers who wish to leave a community to seek employment elsewhere should consult with their local employment office before leaving or they may find themselves ineligible for employment when they arrive in the new locality," Mr. McNutt said.

To permit maximum adjustment to the needs of particular labor market areas a series of optional controls is outlined permitting the extension of USES referral to new groups of occupations and activities.

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AFL Considers Lewis; Threaten Politics

Chicago

• • • **The executive Council** of the American Federation of Labor, meeting here last week, took up the question of readmission of Lewis' United Mine Workers back into the AFL fold, a request made by John L. Lewis.

At the same time, the executive council rejected recent CIO suggestions for a united front of labor unions for the coming political campaigns. The AFL council announced that the usual independent non-partisan committee of AFL will continue to handle the federation's political activities. The council said, however, that the AFL would bend every effort to defeat the legislators who voted for the Smith-Connally anti-strike bill.

After considerable debate on the subject, the AFL council voted to submit, without comment, the request to the AFL convention in October for a vote by the delegates.

Chief obstacle is the AFL Progressive Mine Workers union which was formed to take over the jurisdiction of the mine workers when Lewis left the AFL in 1936 to form the CIO. After leaving the AFL Lewis also formed the District 50 union which is more or less of a catch-all for workers in the field covered by AFL's PMW. AFL mine workers union is demanding that District 50 group be disbanded before Lewis is permitted to return. In fact, the constitution prohibits the existence of unions within AFL with conflicting jurisdiction. However, Lewis refuses to disband District 50.

Referral Hiring Plan Hit By AFL Refusal to Recognize

Buffalo

• • • **Buffalo's two-month-old** referral hiring plan, under which all male job seekers must get their work through the United States Employment Service, struck another sour note this week in a long series of discords when Frank L. Fenton, organization director of the AFL in Washington, advised AFL members of the Buffalo Area War Manpower Committee to "refuse" to have anything more to do with the plan while it functions under a Labor Priorities Committee.

Fenton charged that Mrs. Anna M. Rosenberg, WMC regional director, "exceeded her authority" when she ordered the plan into effect June 14 over the objections of labor and industrial members of the area committee, who rejected the hiring arrangement and claimed only Paul V. McNutt, manpower chief, had the authority to order the plan into use.

The labor leader hit the referral plan as "an undemocratic way of dealing with the local manpower situation," and declared policies for local committees would be promulgated by the "national management-labor body."

"We plan on setting up policies which will enable labor and management representatives to settle their own problems with a minimum of interference from the government," said Fenton.

Labor's chief objection, it appeared, was centered on the priorities committee, which meets secretly and allocates manpower secretly to a preferred list of war plants.

Fenton announced in Washington a plan was being drafted for the regulating of the male labor supply in the Buffalo-Niagara area as a substitute for the present referral plan.

New Low Records in Absenteeism, Spoilage

as that of the other workers. And not only is their record of work produced an excellent one, but their work spoilage is remarkably low and their score on absenteeism is far above the average.

B. F. Corcoran, director of training for the Kidde plants, finds that the chief concern of these blind workers is that they may not be turning out sufficient work. Their obvious desire to keep their record up to highest standards has led their fellow employees to devise a number of ingenious devices to facilitate their work. Many of these are jigs which do away with the time otherwise required to feel for proper operating position.

The presence of blind colleagues among them has had a striking effect on the morale of the other employees. They willingly act as guides to the cafeterias and rest rooms, and do all they can to make the blind feel at home and on an equal basis.

BLIND LEADS BLIND: Arthur Voorhees, supervisor of the New Jersey State Commission for the Blind, sightless himself, was responsible for recommending the use of blind workers such as the woman assembler shown at right in the plants of Walter Kidde & Co. This woman is shown assembling valves in a special jig designed for her use by another employee.

Steel Union Acts to Halt Wildcat Strikes

Chicago

• • • In an apparent effort to halt the wave of "wildcat" strikes that have afflicted the Gary and South Chicago works of Carnegie-Illinois Steel Corp. for some months past, the Gary union (CIO) publicly proposes to suspend any member responsible for unauthorized work stoppages.

This action was taken after 60 cranemen and hookers struck last week, putting another 500 employees out of work. The cranemen returned to work about a day later but another group of 18 shearmen in the finishing department of the Gary sheet and tin mill pulled another wildcat strike on Aug. 11. These men were out about 24 hr. and delayed production of special ordnance steel. This delay in production is expected to prevent the steel company from meeting its August quota on a special type of sheet for military use.

In both cases the strikers' grievance was based on pay rates and in both cases the grievance was already in the process of being considered.

The resolution adopted by the Gary local, United Steel Workers of America (CIO), asserts that members responsible for unauthorized work stoppages will be prosecuted by the union to the extent of expulsion from the union.

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Labor Disputes Still Active

• • • Labor disputes are still ravaging war production in the face of so-called anti-strike legislation and a new WMC ruling which seems to qualify unemployed persons for immediate drafting—strikers being considered temporarily unemployed according to some interpretations. Pay disputes seem to be the most popular, or unpopular, cause of disturbances although high taxes, enforced bond buying and the high cost of living are believed to be the underlying causes. Typical of current labor controversies are the following:

• The South Park plant of Republic Steel Corp. in Buffalo has suffered two work stoppages in the past week affecting about 700 men and hindering production of rifle barrels and shell steel.

• A dispute between 1800 employees of the Worthington Pump & Machinery Corp. in Buffalo and the management has been certified to WLB.

• Jones & Laughlin Steel Corp.'s dispute with 5600 workers in its Aliquippa Works over alleged pay inequalities has been certified to WLB for settlement.

• WLB has received a contract dispute between the Mackintosh Hemphill Co. of Pittsburgh and its employees for settlement. A similar dispute arising in the Champion De Arment Tool Co. of Meadville, Pa., has been referred to the board.

• Marking the seventh strike in Buffalo in seven days, workers at the Crosby Co., steel stampings, walked out at 2 p. m. Aug. 14 and remained out until the next morning.

• A work stoppage at the J. H. Williams & Co., drop forgers, developed Aug. 9 and lasted until the morning of Aug. 11.

• As a result of a grievance dispute, about 1000 steel workers at the Youngwood, Pa., plant of the Robertshaw Thermostat Co. walked out last week.

• After three days' idleness, 150 tool makers at the Yale & Towne plant in Stamford, Conn., returned to work Aug. 10 pending settlement of a piece-work wage dispute by WLB.

• At the Lorain, Ohio, yards of American Shipbuilding Co. a strike of 3500 workers halted construction of 12 Navy and Maritime ships Aug. 10. It was reported the cause was dissatisfaction with the appointment of a new superintendent.

• A production halt of a few hours was forced upon the Chrysler Corp. truck shipping department at Detroit, Aug. 10. It was said to have arisen over protest against the laying off of an employee who company officials said "wouldn't work."

• War shipments of three railroads were tied up on both sides of the Straits of Mackinac Aug. 10 by a strike of 35 unlicensed personnel of carferry crews.

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Few Layoffs Occasioned By 48-hr. Steel Week Here

Birmingham

• • • More than 20,000 workers in the iron and steel industry of the Birmingham district are now on the 48-hr. minimum wartime work week. James A. Downey, Jr., area director of WMC said certain benefits already were evident although the program, completed as of Aug. 1, was too new for management in this area to judge its effect on production and operations.

The 48-hr. week here, he said, has made possible a greater utilization of skilled labor and a reduction in absenteeism is noticeable.

Layoffs in the Birmingham district, he said, have been negligible. At first it was thought some 1,500 to 2,000 workers would have to be cut off in carrying out the directive but in reality only a few hundred men have been laid off during the transitory period, he added.

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Steel Ranks Third Among Industries in Safety Records

• • • Despite the intense pressure of record-breaking production and the addition of many thousands of inexperienced workers to the payrolls, the steel industry in 1942 bettered its position as third in safety record among 32 leading industries, according to a recent study by the American Iron and Steel Institute of records of the National Safety Council.

On a basis of accident occurrence per million man-hours worked, steel mills last year reduced their accident frequency to 7.4 per million hours worked, or 1 per cent below the 1941 figure.

In the year 1934 the industry was rated twelfth in relative freedom from accidents. By 1936 it had risen to sixth place. Four years later, it was fourth.

"Do Not Disturb" Marks Strike Vote

Cleveland

• • • An empty ballot box and one good election booth were resting quietly at the plant of Park Drop Forge Co. here last week.

The company had provided the equipment for a strike vote but both the AFL and the CIO "were too busy to vote." This action was taken by the AFL even though it had voiced irritation with the slowness of the WLB in acting on wage disputes and other grievances involving a contract with the company. The CIO followed suit.

There will be no use for the ballot box as the company has said more orderly processes will be used by them and the unions.

165,000 Steel Men Now in Armed Forces

• • • Close to 165,000 employees from the steel industry have enlisted or have been inducted into the armed forces according to the American Iron and Steel Institute. Included in that number are many key and top notch employees whose loss has been felt in the industry.

By the end of 1941 only 25,000 men had been inducted or had enlisted. In the middle of 1942 the total had risen to 61,000 and now is about one out of four employees at work late in 1940.

Currently about one-third of the steel industries employees are within the 18-38 age bracket from which draftees are now being taken but the majority are married or heads of families.

Other Americas Aim to Expand Steel Output for Most Urgent Needs

• • • **Peacetime annual** consumption of iron and steel products in the other Americas outside of the United States totalled about 1,500,000 tons, most of it imported from Europe and the United States. In 1941 the two chief producers in Latin America—Brazil and Mexico — between them turned out less than 300,000 tons of steel, according to the office of the Coordinator of Inter-American affairs.

Meanwhile, production has been on the uptrend in both of these countries, and projects for steel facilities range all the way from Brazil's large plant at Volta Redonda (most recently discussed in this magazine) to plans which are still in the paper stage. Among those still on paper is a proposed steel plant in Chile, backed by Chile's Fomento Corp.

Illustrative of wartime efforts to increase local production of steel to cover essential needs is the recent opening a a $2,000,000 blast furnace for Mexico's Monterrey Steel Works, with a daily production capacity of 500 tons of pig iron. This new furnace is expected to aid in the rehabilitation of the National Railways of Mexico. Small furnaces have come into production elsewhere, including Argentina.

Like Mexico and other hemisphere countries Brazil has increased need for steel and iron for railway and other development projects. Improvement of communications, especially, is necessary to enable Brazil to increase her output of strategic materials for United Nations war industry. Therefore, the Volta Redonda plant rates high among strategic hemisphere projects.

Argentina with only a small steel industry in relation to her needs, finds herself hard pressed to supply her requirements. Argentina's Central Bank estimates the country's imports of steel and iron this year will approximate only 85,000 tons compared with normal needs of more than 600,000 tons. Substitutes are being used to the utmost. Exploratory work is being conducted to evaluate the country's limited iron deposits. Blast furnaces are being built.

Requirement estimates for 1943 were cut to 300,000 tons. But some shortages, according to the bank, are marked, especially in steel cables, special and rapid steels for tools, lathes and dies, black and galvanized seamless pipes and tubes for oil wells and mining purposes and for broilers, round iron of small diameters for building uses and some classes of railway and tramway material.

With the help of plants that are expected to start production this year, the bank says output of 70,000 tons may be reached in 1943.

The government of Argentina has approved plans for development of an iron industry in the province of Jujuy. Exploratory work on the iron deposits in Zapla indicates the mine could produce 50,000 tons of ore annually. The ore will be treated at blast furnaces being built in Palpala, with annual capacity of 20,000 tons of pig iron.

In Brazil, the Volta Redonda plant with expected initial output of around 300,000 tons yearly will more than double Brazil's annual steel production of recent years. Brazil has shown remarkable progress on smaller iron and steel projects. In the Sao Paulo district there has been a great increase in use of Brazilian ore in production of ferro-alloys like ferro-manganese and ferro-silicon.

One producer in this region has three electrical furnaces with capacity of 5,000 tons a year. Single pieces up to ten tons can be cast. With equipment in its own shops, the company has built a large new electric furnace. Recently, however, it was reported a transformer was needed. When this item is secured, it is predicted production of the plant will almost double.

Brazil has entered the export field with iron and steel products on a small scale. The value of exports of plain and galvanized wire from Brazil in 1941 was reported as 2,658,212 milreis (about $161,104).

Construction of a rolling mill in Medellin, Colombia, has been reported near completion. It is said to have a capacity of 100 tons a day, with two electric furnaces for melting scrap, two gas furnaces for heating ingots and additional furnaces for plates, wires and structural shapes. A blast furnace in the Pecho District is being recommissioned for smelting ore on a small scale.

Peru has made studies of possibilities of developing her coal and iron resources and establishing an industry, based on iron mines in the Marcona region near San Nicolas and San Juan Bays and the coal deposits in the Santa and Chuquicara Valleys. A proposed plan for this development calls for installation of blast furnaces, steel mills and transport facilities at Chimboter, a rising industrial town on the Pan American Highway.

On eastern Venezuela, steps have been taken toward development of an iron mining project. An investigating group a few years ago estimated deposits of up to 270,000,000 tons of ore in one section, with considerably larger possibilities for the whole area.

VICTORY MAINTENANCE PLAN: To keep essential power-generating plants operating at maximum output a "Victory Maintenance Plan for Diesel Electric Plants" has been developed through the cooperative effort of the Diesel engine manufacturers and Westinghouse Electric & Mfg. Co., Pittsburgh. Left to right are the men who assisted in its preparation: L. F. A. Mitchell, N. H. Gimmey, E. E. Lacey and K. M. Patterson.

Steel Warehouses Received Record Lot of Steel Products In 3rd Quarter

Washington

• • • **Merchant trade warehouses** have received in the past three months more bale ties, bale wire, pipe, water well casing and roofing and siding than at any time previous since the war began, according to a WPB Steel Division official.

WPB, which plans to continue to keep dealers well supplied amended order M-21-B-2 on Monday which controls the distribution of merchant trade products to permit the direct replacement stocks sold since April 1.

Orders can be placed after Oct. 1. Warehouses have been able to replace inventories but not directly. Also, the merchant trade warehouses will continue to obtain warehouse load directives of most product groups.

To illustrate how agricultural districts are being assisted more and more, a recently issued directive under the order provides approximately 20,000 tons of wire products for warehouses located in Kansas, Montana, the Dakotas and Wyoming.

The Steel Division is not willing to release tonnage figures for third and fourth quarter allotments to these consumers, but tonnage is said to be more than satisfactorily high. The reason the Steel Division won't release the figures, it is said, is that their publication might lead various states to complain about their share of the whole allotment. Furthermore, one official also contends that if the figure were published, armed service representatives might complain about so much steel being devoted to civilian purposes.

Replacements cannot be ordered unless backed by a record of previous deliveries from stock equal to the tonnage being ordered. WPB says that orders should be placed well in advance to permit cancellation of orders for unwanted products. These products will be distributed to those warehouses which have not received their full requirements.

Warehouses should use PD-83-G or CMP-11 in ordering replacements. Changes made in the order were made to insure equitable distribution of products.

Union Head Prevents Strike in War Plant

Philadelphia

• • • A union president, who went to work as a welder after Pearl Harbor, is credited with preventing a work stoppage at the Quaker City Iron Works. Prior to the time when the scheduled strike was to occur, Charles Daggert, head of the Tank and Body Builders Union of Philadelphia, Local 1, asked permission to speak to the employees. Quitting whistles were blown and when his fellow workers assembled Daggert reminded them that "We're working for them, our own boys." When his talk was over the workers unanimously agreed to call off the strike.

Workers said their grievance was against the NWLB, asserting it had delayed passing on their petition for a 10 per cent wage increase.

Noranda Mines Acquires Wire and Cable Subsidiary

Toronto

• • • **Noranda Mines, Ltd.**, has acquired control of Canada Wire & Cable Co., Ltd., J. Y. Murdoch, president of Noranda, announced. The new subsidiary is one of the largest manufacturers of copper wire, cable, pipe and rods, steel wire rope, solder fittings, etc., in the British Empire, with modern plants at Leaside (Toronto), and Montreal East, Que. The new company affords an important outlet for a portion of Noranda's copper output.

Noranda Mines for the first six months this year reports net profit of $5,664,500 equal to $2.53 per share compared with $5,585,453 or $2.49 per share in the same period of 1942.

Reuse of Steel Drums Limited By Amended L-197

Washington

• • • **Used steel shipping drums** which are suitable for reuse for packing either edible products or naval stores products, may not be used for any other purpose but are restricted to the uses of these industries, according to Amendment 1 to Order L-197, issued by WPB last week.

Exemptions relating to steel drums used for shipments licensed by the Office of Economic Warfare have been restricted to apply only to those drums actually used for exports to points outside the United States, the WPB Containers Division pointed out. While the use of new steel drums for packing turpentine is still prohibited under the order, used drums may be employed for that purpose under the amendment.

Brass Added to Metals Permitted in Union Bonnets

Washington

• • • **Manufacturers of brass** or bronze valves are permitted to use brass or bronze, in addition to malleable iron or steel, for union bonnet rings, union rings and stuffing box packing nuts, by amendment to Order L-252 issued by WPB on Monday.

Under the amended order, any of these materials may be used at the manufacturer's option. The amendment will speed production through simplification of product lines, the WPB Shipbuilding Division said. Valuable engineering man-hours will be saved by eliminating the necessity for conversion of valve-making equipment. The carrying of two stocks of material also will be eliminated and storage space requirements will be reduced.

25% of Rail Freight Provided by Steel

• • • Almost one out of every four tons of freight hauled by American railroads in 1942 consisted either of raw materials going to the nation's steel mills or of steel shipped from the mills to war industries, according to the American Iron and Steel Institute.

The railroads hauled in 1942 a total of approximately 1,421,000,000 tons of freight of all kinds, the Institute said. Of that total, 251,000,000 tons consisted of iron ore and other steelmaking materials en route to steel plants. An additional 76,000,000 tons consisted of shipments from steel mills to consumers. Iron ore was the biggest single item of freight hauled to steel plants last year, 1,875,000 carloads of ore having been moved. Coal was the next most important. Approximately 1,680,000 carloads of coal were hauled to the steel plants to keep blast furnaces going and to provide steam.

Contract Terminations Again Up For Discussion; Uniform Policy Urged

Cleveland

• • • **The long expected** but never developed general policies on termination of contracts again enter the news picture. There is a growing fear among steel producers, contractors, and sub-contractors of present policies of terminating contracts. Apparently, each purchasing agency's methods of closing out a contract vary from the others, and it is felt that a uniform policy must be established. The potentialities of a wholesale cancellation of production of war materiel as regards industry are quite frightening, since many industries, such as steel, aluminum, automotive, etc., have millions of dollars tied up in work in process.

Difficulties are already arising on this score, with prime contractors trying to withhold payments to suppliers of raw material until they are paid by the government for cancelled contracts. Steel producers, for example, object strenuously to this delay, on the basis that the prime contractor is responsible for payment to the steel producer for material purchased on the due date of the bill, and not when the buying agencies negotiate a claim settlement. Likewise, sub-contractors are left high and dry by this policy of withholding payment for work done until the terminated contract is negotiated.

It is believed that eventually a policy will be evolved whereby the prime contractor will be immediately awarded 85 to 90 per cent of the estimated cost of the work done on the contract for paying off bills. Following this, the contract can be audited and final adjustment made.

The inventory restrictions under the Controlled Materials Plan are aiding immeasureably in controlling production so that in case the war were to end suddenly, the termination of war contracts would not wreck industry. While the original intent and purpose of such inventory restrictions was to better distribute raw materials, this phase with regard to war contract termination cannot be overlooked.

COMING EVENTS

Sept. 28 to 30—Iron and Steel Engineers convention, Pittsburgh.
Oct. 11, 12—American Society of Tool Engineers, Indianapolis.
Oct. 13 to 16—The Electrochemical Society, Inc., New York.
Oct. 14, 15—American Machine Tool Distributors' Association, Montebello, P. Q., Canada.
Oct. 18 to 22—National Metal Congress and Exposition, Chicago.
Oct. 28, 29—American Institute of Mining Engineers and American Society of Mechanical Engineers, Pittsburgh.

Specific Uses for Treasury Silver Named

• • • **Treasury silver** made available for use by the recently enacted Green bill, will be permitted only for use in the manufacture of engine bearings, official military insignia, brazing alloys and solders, according to WPB's amended Conservation Order M-199, issued July 29. Under the same order, foreign silver is permitted only in the manufacture of medicines and health supplies, in the photographic industry, for electrical contacts, and in a few other uses, while domestic silver may still be used for non-essential purposes in restricted amounts.

The price double-standard remains, with treasury silver selling for 71.11c. against 45c. for imported silver. Scrap generated in processing of treasury silver becomes "foreign" silver.

July Steel Production Tops June By 111,000 Tons

Washington

• • • **Steel ingot output** was up 111,000 tons in July from the June production figure reported by the American Iron and Steel Institute, allowing for July's extra day.

H. G. Batcheller, WPB vice-chairman in charge of industry operations, said most of this increase was no doubt attributable to the "Share-the-Steel" drive. Mr. Batcheller added that the entire industry deserved credit for the increased production particularly in view of the fact that steelmaking was hampered by the coal strike, excessively hot weather and limited coke supplies.

"Perhaps more than anyone else, Ben Fairless deserves especial credit for his part in making the drive a success. He has devoted much time and effort to this end," Mr. Batcheller said in complimenting Mr. Fairless, who is president of the United States Steel Corp.

Maritime Studies Post-war Era

• • • **Formation of a** post-war planning committee, to develop plans for the American shipping industry after the war, was formally announced by the Maritime Commission Aug. 11. The Commission's action was undertaken pursuant to its statutory responsibility under the Merchant Marine Act of 1936. The Act requires the Commission to make various surveys to determine the shipping requirements of the United States and to assure the maintenance of a Merchant Marine adequate to the needs of commerce and defense.

The post-war committee is headed by Commissioner Howard L. Vickery, serving as chairman, and Commissioner Thomas M. Woodward, serving as co-chairman.

Permit Required for Parts

Washington

• • • **Construction equipment** dealers or distributers located outside the 48 states or the District of Columbia must obtain authorization (Form PD-556) from WPB to purchase repair parts for stock or inventory, according to Interpretation 1 to Order L-192 issued by WPB on Monday. The interpretation also makes clear that branch offices or warehouses outside of these localities must secure similar authorization even though their main offices are located in the states or the District.

Circus Tent Joins In Aircraft Drive

Lancaster, Pa.

• • • Airplanes for Uncle Sam's fighting forces are being built in a circus tent at the Lancaster, Pa., Municipal Airport. This latest development in Pennsylvania's fast growing aircraft industry is another example of the ingenuity of Henry J. Kaiser and his associates. Needing additional space for their operations at Lancaster Kaiser representatives found no building available. The circus "Big Top" was the answer, and now one unit in the production of airplanes is operated under canvas.

Whiting Explains Order M-21-b-2

• • • **Producers and** distributors of merchant products were sent a letter Aug. 13 by John T. Whiting, director of the WPB Steel Division, explaining General Preference Order M-21-b-2, effective Oct. 1. The letter was as follows:

Enclosed herewith is a copy of General Preference Order M-21-b-2, as just amended. Please note that the effective date of this order is Oct. 1, 1943. Until that date the distribution of merchant trade steel products to warehouses and dealers is subject to the provisions of Order M-21-b-2, as amended June 15, 1943.

The new order embraces a number of basic changes in the plan for distributing merchant trade steel products through warehouses under CMP. This complete change was decided upon only after giving careful consideration to all of the problems involved. It is believed, however, that the new plan will automatically give equal consideration to the requirements of agricultural and industrial communities to an extent not possible under the plan used to date.

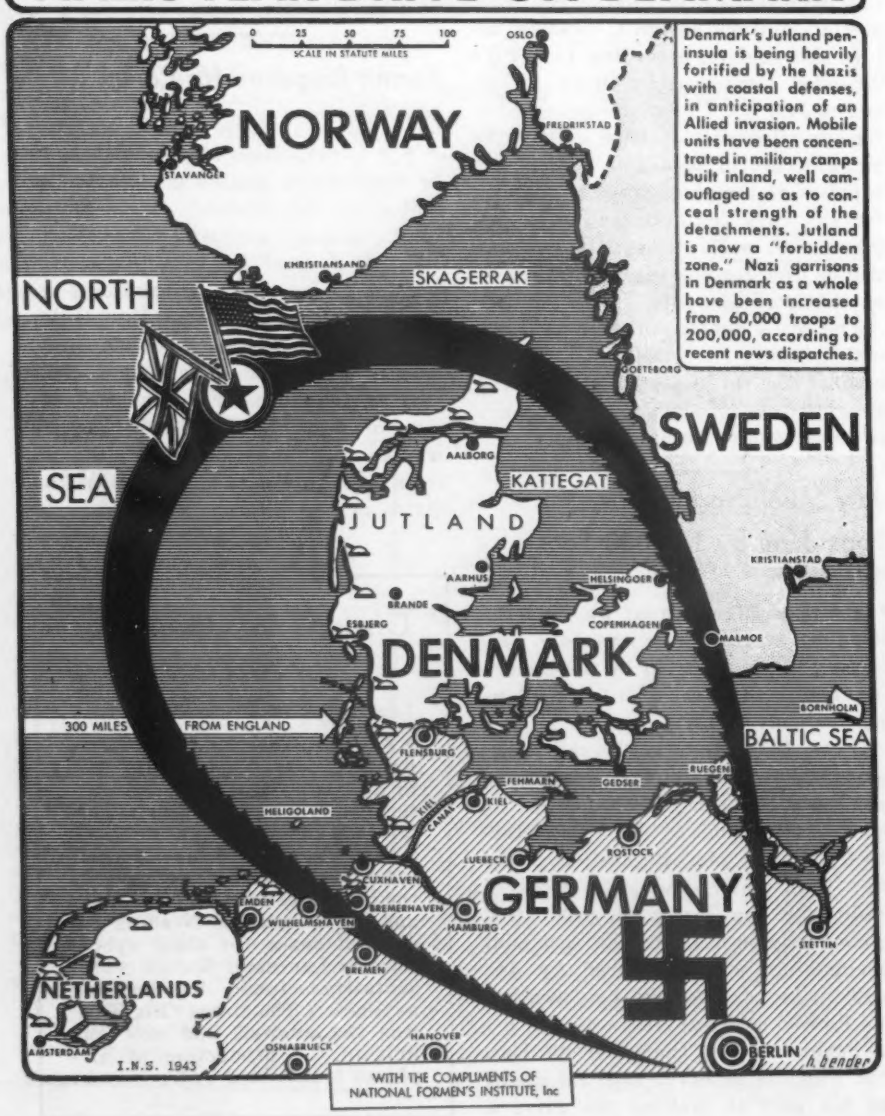
It is suggested that you familiarize yourself and your employees with all details of the new program so that you will be in a position to derive the maximum benefit under the order beginning Oct. 1. Your attention is invited in particular to the following features of the revised program:

(a) Beginning Oct. 1, 1943, warehouses will be authorized to order for stock replacement **all** merchant trade products sold from stock since April 1, 1943, under the terms of CMP Regulation No. 4, plus material sold to dealers and other warehouses pursuant to this order which have not previously been ordered for replacement. Form WPB-2444 must accompany each such order. Prior to that date, warehouses may use Form WPB-2444 (CMP-11) to replace merchant trade products delivered only on authorized controlled material orders. A separate letter of instructions outlining the use of Form WPB-2444 has been prepared for your guidance.

Each warehouse should determine for itself what tonnage of merchant trade products it may order from a producer on or after Oct. 1, pursuant to the revised program. To illustrate how this should be calculated in each case, the following examples are given:

	Example (Net Tons) A	B	C
I. Sales of all merchant trade products, April 1-Sept. 30, 1943, inclusive, pursuant to CMP Regulations:			
1. Sales on authorized controlled material orders (except to dealers and other warehouses)	100	200	...
2. Sales to dealers and other warehouses	50	...	50
3. All other permitted sales, such as orders permitted by Paragraph (d) (4) of CMP Regulation No. 4, and deliveries to farmers pursuant to Priorities Regulation No. 19	50	..	50
4. Total six months' sales of all merchant trade products	200	200	100
II. Deduct:			
5. Receipts of merchant trade products, April 1-Sept. 30, inclusive, pursuant to orders accompanied by Forms PD-83-g or CMP-11 replacing material sold on authorized controlled material orders, or on ratings AA-5 and higher delivered prior to July 1, 1943	75	150	...
6. Merchant trade products on order Oct. 1, 1943, for delivery on or after that date, accompanied by Form CMP-11 or WPB-2444 representing sales on authorized controlled material orders not previously extended	50	50	..
7. Total Deductions	125	200	...
III. Net total tonnage of all merchant trade products which may be ordered on or after Oct. 1, 1943, based on operation during the preceding six months (Line No. 4 minus Line No. 7)	75	None	100

NAZIS FEAR DRIVE ON DENMARK



OPA Appoints Two

• • • **Appointment of** James G. Rogers as assistant general manager and James F. King as deputy administrator in charge of information was announced last week by Chester Bowles, general manager of OPA.

Mr. Rogers has been with OWI since January and Mr. King comes from the Department of Labor.

Price Order Revised For Special Sales of Surplus Industrial Material

• • • **To simplify** and speed sales of surplus stores of iron, steel and copper products, and other essential war items from industrial stockpiles, the OPA Aug. 13 revised Maximum Price Regulation No. 204 to cover pricing of all idle or surplus materials, regardless of whether or not they are subject to any WPB order.

Previously the regulation was titled Maximum Price Regulation No. 204 (Idle or Frozen Materials Sold Under Priorities Regulation No. 13) and covered only items subject to WPB Priorities Regulation No. 13.

The title now has been changed to read Revised Maximum Price Regulation No. 204 (Special Sales of Industrial Materials), and its context revised so that it makes no reference to Priorities Regulation No. 13. As a result, sellers henceforth will not have to check WPB files to determine whether they must sell a certain material under the regulation.

The revised regulation becomes effective Aug. 19.

The revision, in addition, extensively simplifies the regulation's language, incorporates amendments and interpretations into its text, but makes no substantial change in maximum prices for sales of idle or frozen materials.

In one addition to its provisions, the regulation permits utility companies to sell materials, such as copper wire, copper plates, and iron and steel shapes and plates, to each other on the basis of book costs plus 10 per cent for handling, a new simplified method. This action was taken at the request of the WPB to facilitate the re-distribution of utilities' idle or surplus stocks of materials under WPB's Utilities Order U-1, as amended May 31.

o o o

Farm Tool Restrictions Eased More

Washington

• • • **WPB last Friday announced** an amendment to L-257-a which revises production quotas of farm machinery and equipment for export to Canada. The order was amended to make clear that machinery and equipment produced for Canada may be carried over and shipped after the expiration date of the production period, July 1, 1943 to June 30, 1944.

Production of farm machinery and equipment for the United Kingdom (Schedule X-3) was increased from 69 per cent to 87 per cent, providing particularly for additional spare parts. WPB said that no increase in the use of materials will result, however, since the increase was taken from a reserve set up for the United Kingdom by L-257-a.

WPB also announced that it had amended Priorities Regulation No. 19 to give farmers priority in shops for the repair of farm equipment. Under the amendment a farmer need only submit a certificate of need at a repair shop. The farmer's order supported by his certificate is to be considered the same as an order rated AA-5. The step taken is in line with the program worked out by OCR to assist farmers in obtaining supplies they need to increase food production.

The list of farm supplies covered by the regulation also was revised, 38 items being added and some 26 deleted. Most of the latter were brought under L-257. Steel mill and wire mill products which dealers may not obtain by extending the farmers' certificates to get priority have been marked with an asterisk on the regulation instead of enumerating them separately. These items, whose distribution is handled under CMP, are barbed wire, BX or non-metallic sheath cable up to 75 ft. in length, fencing, nails, certain types of pipe, pipe couplings, poultry flooring and netting, ridge roll and valley tin, corrugated roofing, fencing and netting staples, weatherproof copper wire for circuits up to 75 ft. in length and bale ties.

•

More Farm Supplies Granted Warehouses

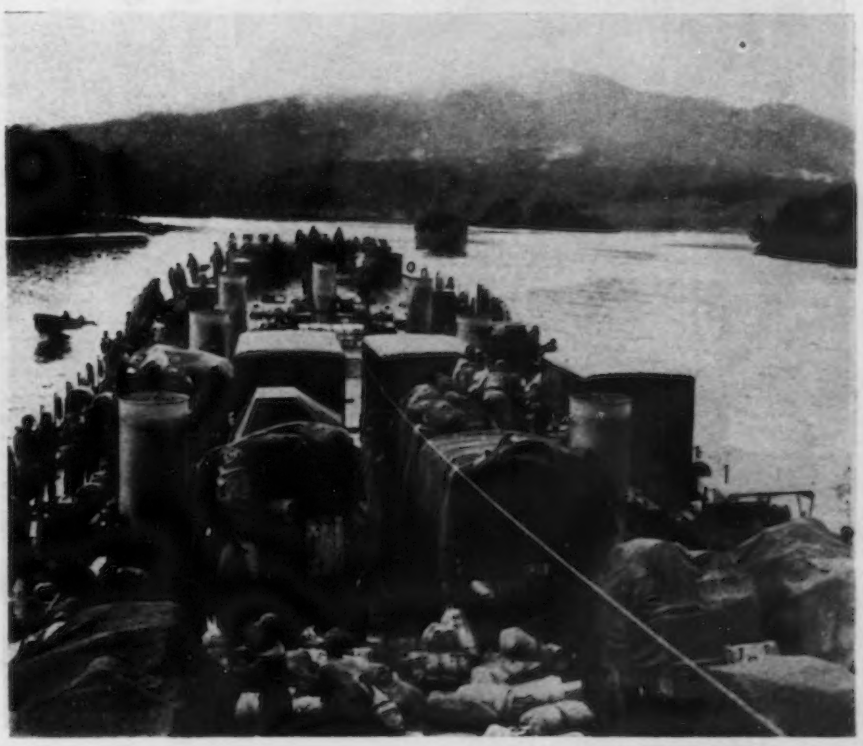
Washington

• • • **Warehouses in six western** states last week were granted WPB permission to increase their purchases of certain steel products for farm use. The affected warehouses are located in Kansas, Montana, Nebraska, North Dakota, South Dakota and Wyoming. The products whose purchases may be increased are cut and wire nails, fence and netting staples, drawn-wire, wire bale ties, barbed and twisted wire, woven or welded wire fence and netting and fence posts.

Provision for increased purchases of these products was made in Direction 1 to General Preference Order M-21-b-2. It was issued, WPB said, because a more nearly normal crop growing season now exists and the additional steel was allowed in order

SUPPLIES FOR RENDOVA ISLAND: Jammed to the "gunnels" with supplies two LSTs (landing ship-tanks) approach Rendova Island recently taken from the Japs by American Forces. The Marines call the LSTs "green dragons" because of their special coloring.

Official U. S. Navy Photo from International News



to let the affected warehouses get their proportionate needs.

The direction said that prior to Oct. 1, orders for delivery to stock during the Aug. 1-Dec. 31 period may be placed by a warehouse with a producer up to 100 per cent of the warehouse's base tonnage with that producer regardless of the amount of material received before Aug. 1. However, orders for nails and fence and netting, and fence posts placed pursuant to a warehouse load directive for delivery in the last half of 1943 shall be considered part of and not an addition to increased allowance.

o o o

Royalties Revised on Three Ores

• • • **Four changes** in OPA provisions applicable to royalties on copper, lead and zinc ores were announced Aug. 12 by OPA.

The changes are contained in Amendment No. 1 to Maximum Price Regulation No. 356 (Royalties on Copper, Lead and Zinc Ores), and became effective Aug. 17. They are as follows:

1—The regulation is clarified to state specifically that it does not apply to any payment made for work, labor or services, even though such payment is stated as part of the proceeds of a mining operation. The amendment also provides that the regulation shall not apply to any payment made under any lease, contract or agreement between the principal operator of a mining property and another person who is mining a part of the same property if the lessee does not have a separate quota under the premium price plan for copper, lead and zinc.

2—The amendment provides for payment, subject to OPA approval, of an overriding royalty, even though the override might make the total royalty exceed that which might be payable under the lease in effect on Dec. 31, 1942—the freeze date for royalties. (The regulation provides that the maximum royalty which may be paid or received on copper, lead and zinc ores mined from any property under lease on Dec. 31, 1942, shall be no higher than the royalty provided by the lease in effect on that date.)

3—The amendment provides that where the royalty return calculated under the terms of a lease in effect on Dec. 31, 1942, has decreased sharply or disappeared entirely due to decline in grade of ore or other cause, the parties to the royalty agreement may apply to OPA for permission to pay a royalty of not less than a stated amount.

4—The amendment also provides a simplified method for lessees or lessors to seek approval of royalty terms applicable to a group of properties which were not under lease on Dec. 31, 1942, the freeze date. Under this new method, a lessor or lessee may apply to OPA for advance blanket approval of royalty terms when he has a number of similar properties which he plans to lease.

"BASE BUSTER": Fighting Marines gather at the beach to see a "Base Buster" landed on Rendova Island. Big guns such as the one shown here were used to shell the Japs at Munda from Rendova.

Official U. S. Navy Photo from International News

OEW Eliminates PD-1A On Some Commodities

Washington

• • • **The Office of Economic** Warfare has received authorization from WPB to assign preference ratings for certain commodities for the third quarter of 1943, thereby making it unnecessary for exporters to file WPB Form PD-1A (WPB-541) or other WPB release certificates for these commodities. These commodities are grouped according to the WPB Industry Divisions which handle them and are listed in current Export Bulletin No. 12. Preference ratings for these commodities will be assigned by the OEW and stamped on the face of the export license in the manner prescribed by the WPB.

The elimination of PD-1A or other WPB supply assistance forms for these commodities does not in any way change the regulations for filing export license applications or import recommendations or other OEW forms. As authorizations to assign preference ratings to additional commodities are received, notice of these authorizations will be announced in future current export bulletins.

It is important, when filing export license applications for these commodities, for the exporters to indicate under the commodity description whether or not a preference rating is requested. The Schedule B number for the commodity must be designated on each application. In addition, where Class B products are involved, the appropriate CMP Code Number must also be entered on the export license application. This additional information on Class B products will facilitate the processing of applications.

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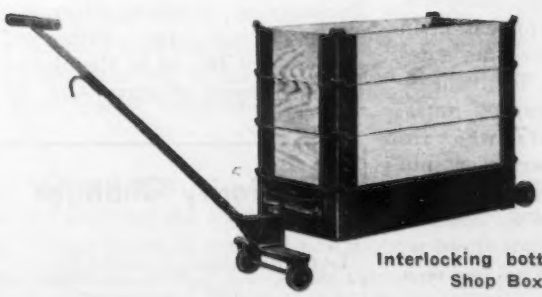

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Shop Boxes

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FACTORY SERVICE COMPANY

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The authority prescribed herein does not change the present procedure for handling controlled materials and CMP Class A products.

• • • **Exporters are advised** that "Marine Diesel Engines — Auxiliary or Main Propulsion," presently classified as CMP Class B product under CMP Code No. 560, have been designated by WPB as a Special B product. Therefore, although such marine Diesel engines are CMP Class B products, they will be subject to the following procedure: Exporters will file Form CMP-4A in duplicate with all applications for export license for marine Diesel engines, together with customary BEW 119 or other export application form, and import recommendation or certificate of necessity. No PD-1A or other WPB form will be required. Designation of Schedule B and CMP Code Numbers should be shown on the application.

•

New Deadline Established Upon Requests for Alloys

• • • **Starting in** September, requests for allocations of chromium, molybdenum, vanadium, and nickel must be mailed after the first of the month and before the 7th of the month. At present the 20th of the preceding month is the deadline.

Then allocations will be made to complete September schedules and provide stock for the first week in October. Normally, forms due Aug. 20 would be September requests but will not be so considered.

The new revised forms will set forth the total alloy in all forms which the applicant proposes to use during the current month and must not exceed his best estimate of what he can actually melt, even though it may not equal the total of his approved schedules for the month.

No change is involved in procedure for consumers who file PD-391 and PD-440 schedules.

•

Petroleum Industry Aided By Revision of Order P-98-b

• • • **Preference** Rating Order P-98-b, affecting the petroleum industry, was amended Aug. 9 in two important respects. Production operators now are authorized to use a rating of AA-2X in obtaining materials (other than maintenance, repair and operating materials) for production operations. It is no longer necessary for any petroleum operator, regardless of which branch of the industry is concerned, to place both a preference rating and an allotment number on delivery orders.

Thus, the need for filing WPB-2565 applications is eliminated in certain instances including production operators who do not require controlled materials need not file such applications; Production operators who require capital equipment in advance of the time an application is filed for an allotment of controlled materials, need not file a special application in advance of such time, since the automatic preference rating is available to them to secure such capital items, and production operators who are able to project their operations into a calendar quarter beyond the one for which they have filed an application for controlled materials, need no longer file an application to secure a preference rating for capital items for use in such future calendar quarters.

•

M-126 Amended Aug. 10 Is Reworded and Simplified

Washington

• • • **Reworded so as** to make it clear, WPB last Thursday issued Conservation Order M-126. The stainless steel list has been omitted in the amended order and articles which were in the list have been incorporated in List A. The definition of "iron and steel" was reworded to expressly include stainless steel.

Control of many items on List A was delegated to other existing L and M orders. Some have been more restricted and some less restricted.

WPB-2444 Replaces CMP-11 Oct. 1 for Steel Warehouses

• • • **Changes in** the WPB steel warehouse program for merchant trade products will be effective Oct. 1. All orders for merchant products placed with a producer or another warehouse for delivery to warehouse stock on and after Oct. 1 must be accompanied by Form WPB-2444, formerly known as CMP-11. Orders prior to Oct. 1 must conform with Order M-21-b-2 as amended June 15.

WPB-2444 may be used in connection with merchant trade products through Sept. 30 only to replace material sold from warehouse stock during the preceding 90 days on authorized controlled material orders.

•

Solder, Babbitt Metal Prices

• • • **Sellers of** solder and babbitt metal were authorized by OPA Aug. 10 to add to their prices the increased costs resulting from use of Treasury silver sold under the Green Act.

The maximum price henceforth for any solder or babbitt metal containing silver is established as the highest price the seller charged during March, 1942, plus 9.634c. per fine troy ounce of foreign silver contained in the product, or plus 36.125c. if Treasury or domestic silver is used. These prices are authorized in Amendment No. 15 to Regulation No. 14 and became effective Aug. 10.

Additional CMP Developments

• Allocation of copper castings will have tight restrictions imposed regarding the quantities of material.

•

• Direction 21 to Reg. 1 provides a simple method for use by retailers and warehouses in supplying copper wire to farmers under CMP. (Release No. TCS-410)

•

• Supplementary Brass Mill Warehouse Direction 1-a of Reg. 4, Wire Mill Warehouse Direction 1 of Reg. 4 and Brass Mill Warehouse Direction 1 of Reg. 4 have been revoked.

•

• Direction 24 to Reg. 1 rules that steel shapes, plates, bars, concrete reinforcing bars and wire products used for reinforcing concrete, in controlled material form, and on which cutting to size for a specific project has been performed, are to be treated as Class A products.

•

• Interpretation 12 to Reg. 1 rules that reduction in the quantity of controlled materials covered by an authorized controlled material order does not constitute the placement of a new order and the reduced order retains its place in the mill schedule.

•

• Direction 11 to Reg. 5 establishes a method permitting employees to use their employers' MRO preference ratings to purchase safety equipment.

Priority Changes

L-172—Amendment I clarifies the point that purchase orders for heat exchangers authorized prior to July 9 are subject to the scheduling provisions of the order unless otherwise directed by WPB in a particular case. (8-13-43)

•

L-257-a—Amended order revises production quotas of farm machinery and equipment for export to Canada. (8-13-43)

•

M-21-b-2—Direction 1 grants WPB permission to warehouses in six Western states to increase their purchases of certain steel products for farm use.

•

M-65—Amended order prohibits the use of cadmium in pigments, except for specific purposes, most of which are military. (7-26-43)

•

M-126—Amended order reworded so as to make more clear.

•

P-98-b—Amended order affecting the petroleum industry authorizes production operators to use a rating of AA-2X in obtaining materials (other than MRO) for production operations. It is no longer necessary for any petroleum operator to place both a preference rating and an allotment number on delivery orders. (8-9-43)

•

P-136—Revised order controls use of preference ratings by scrap metal processors for maintenance, repairs, and operating supplies. (8-11-43)

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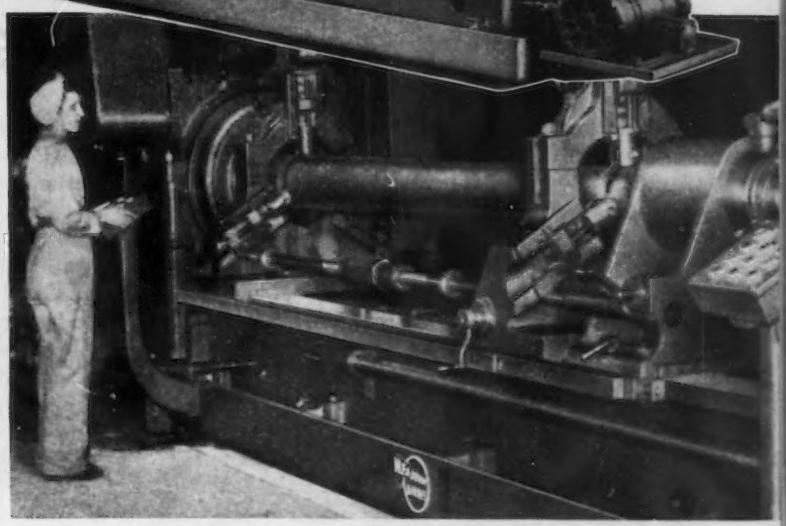

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Idle Copper Tubing To Be Redistributed

Washington

• • • **WPB estimates** that 2,500,000 lb. of copper will be recovered under its program to redistribute idle copper water tubing in the possession of water utilities having inventories in excess of practical working minimums as defined in Utilities Order U-1.

Inventory records of water utilities operating in cities of 50,000 or more population are already on file with the Office of War Utilities. WPB has sent letters to those operating excess inventories of copper tubing, informing them of the activities of the Copper Recovery Corp. in attempting to locate authorized war users for their materials in their present form.

If, however, existing stocks cannot be moved "as is" in a reasonable length of time, the Government is offering to pay the same prices as are effective in the rest of the copper recovery program. For material purchased for remelting or reprocessing, the Government will pay the following prices per pound: tubing under ¾ in., 24c.; tubing ¾ in. and over, 18c.; both prices f.o.b. point of shipment.

Water utilities in cities of under 50,000 population are believed to hold substantial amounts of the needed material. To bring these companies into the recovery program, the Office of War Utilities and the redistribution Division have arranged to send them reporting forms.

•

OCR Steel Lot Cut

Washington

• • • **Through error in** THE IRON AGE of Aug. 12, page 123, it was stated that the fourth quarter allotment of carbon steel for OCR was not reduced by the WPB Requirements Committee. A further check reveals that OCR received slightly more than 90 per cent of its original request for the fourth quarter making its allotment larger than that for the third quarter.

•

Heat Exchangers Scheduled

• • • **Purchase orders for** heat exchangers authorized prior to July 9, the date of issuance of General Limitation Order L-172 as amended, are subject to the scheduling provisions of the order unless otherwise directed by WPB in a particular case. This point is clarified in Amendment I to the order issued last week by WPB.

The amendment also states that a tube bundle or shell or pressure vessel designed for replacement in a critical heat exchanger in Group I or Group II, as defined in the order, is included in its respective group. Several typographical errors in the order printed July 9 are corrected by the amendment issued August 13.

•

Reduced Orders Maintain Place on Rolling Schedules

Washington

• • • **WPB last Friday** in Interpretation No. 12 to CMP Regulation No. 1 said that reduction in the quantity of controlled materials covered by an authorized controlled material order does not constitute the placement of a new order and the reduced order retains its place in the mill schedule.

However, where the quantity of controlled materials covered by an authorized controlled materials order is reduced below a minimum mill quantity, the producer may, when the reduction is made, reject the order and remove it from his production schedule. It was added that in removing orders from his production schedule, the producer may not discriminate among customers.

•

MRO for Safety Equipment

A method permitting employees to use their employers' MRO preference ratings to purchase safety equipment has been established under CMP Regulation No. 5, by Direction No. 11 issued Aug. 11, the WPB announced last week.

Employees of persons operating businesses listed in Schedules I and II of CMP Regulation No. 5, are eligible to use the procedure. Ratings may be used by an employee only for the purchase of safety equipment to be used exclusively in his employer's business.

In order to use his employer's preference rating under CMP Regulation No. 5 for the purchase of such equipment, an employee must obtain from him a certificate, indicating the type and size of safety equipment required, that it is required in the employer's business, that the employer requires the employee to furnish the equipment, and that the employee does not possess any satisfactory substitute. The employer and the employee both must sign this certificate.

•

WPB Announces Formation Of New Industry Committees

• • • **WPB recently** announced the formation of the following industry advisory committees:

MOTORCYCLE INDUSTRY ADVISORY COMMITTEE—Government Presiding Officer: John E. Graham. Committee members are William H. Davidson, Harley-Davidson Motor Co., Milwaukee, Wis.; D. L. Moody, Indian Motorcycle Co., Springfield, Mass.

STEEL BOILER INDUSTRY ADVISORY COMMITTEE—Government Presiding Officer: William F. Bilyeu. Committee members are: James Axeman, Spencer Heater Division, Williamsport, Pa.; J. F. Johnston, Johnston Bros., Inc., Ferrysburg, Mich.; John R. Collette, Pacific Steel Boiler Division, Detroit; Fred Klein, Orr & Sembower, Inc., Reading, Pa.; R. B. Dickson, Kewanee Boiler Corp., Kewanee, Ill.; Edward W. Mears, Mears-Kane-Ofeldt, Inc., Philadelphia; Fred Hainer, Cleaver Brooks Co., Milwaukee; G. E. Olsen, Fitzgibbons Boiler Co., Inc., New York; L. N. Hunter, National Radiator Co., Johnstown, Pa.; Horace H. Peek, Jr., Lookout Boiler & Mfg. Co., Chattanooga, Tenn.

•

Class A Products Include Bars, Shapes for Specific Jobs

• • • **Direction 24** to CMP Reg. 1, on Aug. 10 ruled that steel shapes, plates, bars, concrete reinforcing bars and wire products used for reinforcing concrete, in controlled material form, and on which cutting to size for a specific project has been performed, are to be treated as Class A products.

Products furnished by a fabricator in controlled material form under this direction must nevertheless be treated as a controlled material by the customer of the fabricator for the purpose of the inventory restrictions of CMP Reg. 2. The direction does not apply to that part of a fabricator's operations subject to any order or regulation governing the distribution of steel from, or the procurement of steel for, warehouse stocks.

Price Briefs

• Amendment 15 to Revised Supplementary Reg. 14 authorizes sellers of solder and babbitt metal to add to their prices the increased costs resulting from use of Treasury silver sold under the Green Act.

•

• Amendment 1 to Max. Price Reg. 356 lists four changes in OPA provisions applicable to royalties on copper, lead and zinc ores.

•

• Amendment 1 to MPR 406 excludes therefrom plastic pipe and plastic tubing manufactured from Saran B-11. (Release No. TCS-747)

•

• Amendment 2 to MPR 2 gives sellers of aluminum scrap under contracts entered into before June 23 an additional 30 days in which to deliver material under the contracts at the old higher maximum prices in effect before that date. On June 23 maximum prices for aluminum scrap and secondary aluminum ingot were reduced approximately one cent a lb. (Release No. TCS-743)

•

• Max. Price Reg. 204 has been revised to simplify and speed sales of surplus stores of iron, steel and copper products from industrial stockpiles.

OUR *check* OF THESE

7 *vital maintenance and repair needs*

LEADS TO INCREASED LIFE AND EFFICIENCY OF *any make* COOLING TOWER

1 Condition of decks or filling.

2 Condition of flumes or distributing system.

3 Analysis of water loading for optimum performance.

4 Analysis of net effect of recycling.

5 Condition of stair treads, ladder rungs and hand rails.

6 General condition of structure.

7 Condition of mechanical equipment (motors, fans, gears, flexible couplings, etc.)

TO GET colder water from your present cooling tower, *regardless of make or type,* consider these *Maintenance* and *Repair* needs now. (1) Sagging decks cause channeling, prevent water break-up, thus decreasing cooling. (2) Warped flumes or a faulty distributing system result in unbalanced distribution of water through the tower, producing higher temperatures. (3) Water overloading or under-loading may decrease heat dissipation, thus lowering cooling efficiency. (4) Excessive recycling decreases the cooling capacity of incoming air. (5) Rotted or broken stair treads, ladder rungs, or hand rails cause accidents. (6) Lumber delignification may be weakening the entire tower structure. (7) Improperly adjusted mechanical equipment causes unbalanced air-water ratio, resulting in burned out motors, damaged fans and stripped gears.

These conditions may exist in *your* cooling tower.

Fluor *Maintenance* and *Repair* service corrects these conditions, prolongs the life and increases the efficiency of your cooling tower, whether atmospheric or mechanical draft type.

For immediate action call a Fluor man today or write or wire your nearest Fluor office.

FLUOR

COOLING TOWER DIVISION OF THE FLUOR CORPORATION, LTD.

2500 SO. ATLANTIC BOULEVARD, LOS ANGELES 22, CALIF. • NEW YORK • PITTSBURGH • KANSAS CITY • HOUSTON

SINCE 1890

ROEBLING *Wires*

ROUND . . . FLAT . . . SHAPED

WIRES TYPICAL OF ROEBLING'S BROAD SPECIALTY PRODUCTION

☆

TEMPERED AND BLUED FLAT WIRE TO SPRING SPECIFICATIONS

Have you a "spec" problem on steel for springs? It is very possible you have, for springs are vital — large and small they serve a multitude of war jobs from opening a parachute to absorbing recoil on a gun.

But whether you have to deal with helical springs, flat springs, or stampings, Roebling Steel Round or Flat Wires can help you to a successful solution.

Take, for instance, some of the factors involved: hardness, toughness, temper, accuracy. Roebling's tempered and blued flat wire is made to meet the most exacting specifications in all of these categories. Moreover, Roebling wires are shipped "equipped for action", ready as received to go into your final fabricating operations, measuring up faithfully to all specifications of dimensions and finish, and remarkably free from defects on surface and edges.

Roebling's long experience, facilities, skill and war-won training are at your disposal. Why not submit any spring steel problem you may have to experts who will gladly advise and save you time and trouble? Prompt action on war orders.

JAR ROEBLING

JOHN A. ROEBLING'S SONS COMPANY

TRENTON, NEW JERSEY · Branches and Warehouses in Principal Cities

1942 Records in Coke Are Summarized; Output Rose 8%

• • • **The year 1942** witnessed a new high coke production record for the United States in response to the heavy demand of the iron and steel industry for metallurgical fuel. The total output of byproduct and beehive coke was 70,568,944 net tons, an increase of 5,382,366 tons (8 per cent), over the last previous high record in 1941. Of the amount of coke produced in 1942, byproduct ovens supplied 62,294,909 tons (88 per cent) and beehive ovens 8,274,035 tons (12 per cent). Byproduct-coke production increased 3,812,487 tons (7 per cent) in 1942 compared with 1941, and the production of beehive coke increased 1,569,879 tons (23 per cent). Although the 1942 output from beehive ovens represented only 12 per cent of the nation's total coke production, its contribution to the 1942 war program was noteworthy. Of the 7,309,337 tons of beehive coke produced in Pennsylvania, 6,561,085 tons (90 per cent) were used in blast furnaces, mostly in the Pittsburgh district, where pig iron production would have been seriously hampered without the supply from nearby beehive coke plants.

These statistics were released July 22 by the Bureau of Mines.

The total value of coke, breeze, and tar produced and of other byproducts sold in 1942 was $629,408,422, an increase of 17 per cent over 1941, and exceeded that of any previous year. The greatest increase was in the value

PACKARD EXPANSION: George T. Christopher, left, president of Packard Motor Car Co. and R. R. Rees plan the operations of a new Ohio war industry in the $5,000,000 Toledo factory Packard has just taken over. Rees will manage the new Packard-Toledo Division.

Again Apex helps the users of Phillips Screws!

APEX announces a series of bit holders that revolutionizes the use of Power Bits and Hand Drivers for Phillips Recessed Head Screws. Here's what they do:

One Save you money after original installation of holders is made because they eliminate necessity of carrying so many different sizes of screw driver bits. Only item necessary to carry in stock is the insert tips. One range of inserts fits various sizes of holders.

Two Save vitally needed critical steel and release it for other war time users.

Three Increase bit life due to the float between insert and holder, allowing for easier direct alignment with recess in screw.

Four Decrease handling cost of screw driver bits because it is no longer necessary to return screw drivers for reconditioning as cost of inserts is approximately that of the reconditioning charge.

Send for Bulletin No. 102 giving complete details.

APEX

THE APEX MACHINE & TOOL COMPANY • DAYTON, OHIO

Manufacturers of Power Bits for Phillips, Slotted Head and Clutch Head Screws; and Hand Tools for Phillips and Clutch Head Screws.

FOR THE
War-Time Foundry-
★ MORE TONS PER HEAT
THROUGH MODERN OPEN HEARTH DESIGN AND CONSTRUCTION!

Swindell 40-ton Open Hearth Furnace—one of many serving the metallurgical industry.

SWINDELL FURNACES
CAPACITIES FROM 5 TO 200 TONS
★ Send Us Your Inquiries!

SWINDELL-DRESSLER Corporation
DESIGNERS AND BUILDERS OF MODERN INDUSTRIAL FURNACES
PITTSBURGH, PA.

of byproduct coke produced, which rose from $316,477,231 in 1941 to $378,011,967 in 1942, an increase of 19 per cent; the value of byproducts sold rose from $158,809,184 to $176,932,465, an increase of 11 per cent for the same period.

The production of screenings or breeze in 1942 was 4,751,683 tons and exceeded the 1941 output by 197,170 tons (4 per cent); the average receipts from sales of breeze increased from $2.35 a ton in 1941 to $2.63 in 1942.

The total consumption of coke in the United States in 1942 showed a marked increase when compared with 1941. The principal branch of consumption was in the blast furnaces, and the quantity used by the producers, sold to financially affiliated corporations, or to other companies for blast furnace use was 55,491,570 tons, an increase of 5,037,245 tons (10 per cent) over the 1941 figure. Coke used for other purposes (in foundries, for the manufacture of producer gas and water gas, and for other industrial purposes) increased 953,836 tons (12 per cent) over the 1941 figure and totaled 9,190,418 tons. Coke sold for domestic use was reported as 6,061,694 tons compared with 6,682,959 tons in 1941. The continued decrease in the quantity of coke used for domestic heating in 1942 emphasized the demand of the iron and steel industry.

The quantity of gas produced in 1942 totaled 944,879,637 thousand cubic feet, a gain of 6 per cent over the 1941 figure. Crude coal tar output at 740,175,619 gallons was up 3 per cent; production of ammonium sulphate or equivalent increased 4 per cent to 1,805,025,721 lbs. Data on the production of crude light oil are withheld for war purposes.

$2 Million Job Heads New War Department Awards

• • • **The War** Department announced Aug. 9:

Award of a contract to J. C. Boespflug Construction Co., Seattle, for construction at a military installation in Pierce County, Washington, to cost in excess of two million dollars.

Award of a contract to Poirier & McLane Corp., New York, for construction at an Army Air Forces installation in Erie County, N. Y., to cost in excess of one million dollars.

Award of a contract to Albert A. Lutz Co., Inc., New York, for construction at a military installation in Suffolk County, N. Y., to cost in excess of one million dollars.

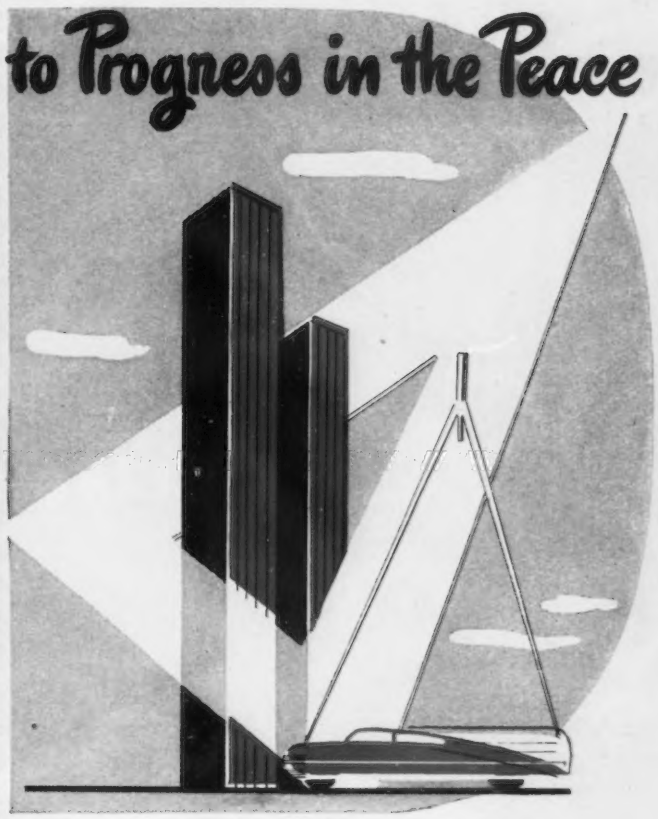
Authorization for construction of roads at a military installation in Coconino County, Arizona, to cost one million dollars.

Authorization for construction at an Army Air Forces installation in Bexar County, Texas, to cost in excess of [illegible] million dollars.

SKILLS GEARED

to Victory in the War

to Progress in the Peace



The war has given American industry the ultimate test of its productive power. And industry has matched new requirements with new capacities—has met new problems with improved methods.

Here at Aluminum Industries, aluminum and magnesium casting techniques developed through years of experience are being further perfected to speed the victory of our fighting men. Even finer precision — even closer tolerances — are being demanded and obtained on every job.

When the present crisis is over, it will leave us with new standards of quality and service. With skills geared to wartime accomplishment, Aluminum Industries will apply itself to the problems and possibilities of a peace-time world.

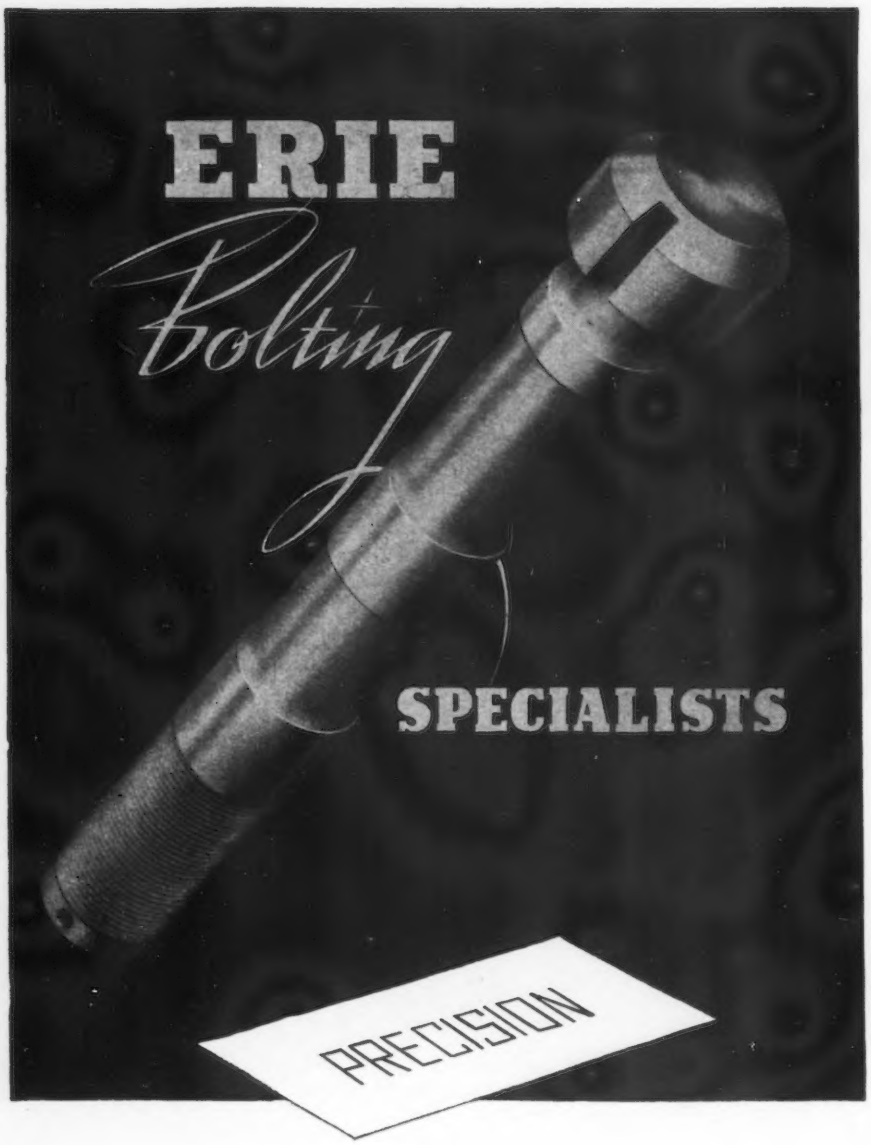
ALUMINUM INDUSTRIES, INC., CINCINNATI, OHIO

Detroit: 902 New Center Building

Los Angeles: 324 North San Pedro Street

Chicago: 616 South Michigan Avenue

PERMITE ALUMINUM AND MAGNESIUM ALLOY CASTINGS



THIS very special Diesel Engine Bolt illustrates the kind of precision bolting that we are producing for war materiel. We are prepared to work to exacting specifications and are willing at any time to offer our experience in helping your engineers secure the right bolt, stud or nut for the job. Our representatives are trained bolting specialists, familiar with refinery, power plant and industrial equipment that require temperature, pressure and corrosion resistance bolting.

ERIE BOLT & NUT CO.
ERIE, PA., U. S. A.

Tung Oil Shortage May Be Eased by Production in S. A.

• • • War needs are stimulating the production of tung oil in South America. Brazil, Argentina and Paraguay are growing tung trees in commercially important quantities. Experiments with the trees are being conducted in Cuba and in six other areas.

In Brazil, a Sociedade Brasileira de Oleo Tung has been formed, to encourage production. Planting of tung trees in the northern part of the Brazilian state of Parana has exceeded expectations in the 1942-43 season. Originally it was predicted about 300,000 trees would be planted, in addition to 350,000 already there. More recent reports, however, have indicated that some 1,500,000 trees were actually planted.

Growing of tung in Argentina dates back at least to 1929, when one of the first plantings was made at Playadito, Corrientes. A total of 113 trees were established on a 2½ acre tract. In recent years Argentine interest in tung has grown rapidly. One plantation, with about 865 acres of tung trees, planted 494 additional acres in 1941. Another with 3707 acres planted 500 acres more. Many small growers doubled their acreage.

These are indications that Argentina's total number of tung trees increased substantially since overall figures last were published, in the agricultural census of 1936-37. At that time 564 Argentine farms had 370,622 tung trees on 8406 acres.

Argentina has three mills processing tung oils. One of these, at Posadas, was built to handle tung fruit from a single plantation of 100,000 trees.

Paraguayan cultivation of tung occurs chiefly at the Hohenau Colony, some 50 miles northeast of Encarnacion. Between 1200 to 1500 acres are devoted to tung in this area.

Plastics Committee Picked

• • • **Appointment** of five members of the plastics industry to serve on an industry advisory committee for plastic thermosetting laminates was announced Aug. 10 by OPA. Membership includes:

D. J. O'Conor, president, Formica Insulation Co., Cincinnati; C. C. Steck, president, Spaulding Fibre Co., Tonawanda, N. Y.; William H. Milton, Jr., General Electric Co., Pittsfield, Mass.; R. R. Titus, president, Synthane Corp., Oaks, Pa.; C. R. Mahaney, general manager, Panelyte Division, St. Regis Paper Co., Trenton, N. J.

ARCOS ELECTRODE
STUD END IDENTIFICATION
COLOR CHART

For Arcos Electrodes manufactured after May 1, 1943

GRADE	TYPE No. (See Note)	END COLOR (Primary)	SIDE COLOR (Secondary)
Chromend 16/7	301X	Yellow	Black
Chromend K	308	Yellow	.....
Chromang	307	Black	.....
Chromend 19/9 Cb	347	Yellow	Blue
Chromend K-Mo	316	Yellow	White
Chromend K-Mo-Cb	316 + Cb	Yellow	Green
Chromend 18/8 Mo	317	Yellow	Brown
Chromend KS	302 + B	Yellow	Red
Stainlend K	308	Black	.....
Chromend HC	309	Black	White
Chromend 25/12 Cb	309 + Cb	Black	Blue
Stainlend HC	309	Red	White
Chromend HCN	310	Red	.....
Chromend 25/20 Cb	310 + Cb	Red	Blue
Chromend 25/20 Mo	310 + Mo	Green	White
Chromend HN	311	Green	Light Green
Chromend 8/18	325	Green	Brown
Chromend 25/3 Mo	329	Green	Yellow
Chromend 29/9	312	Green	Red
Chromend 15/35	330	Green	.....
Chromend 13/60	.....	Green	Blue
Chromend 13/75	Inconel	Green	Orange
Chromend 15/85	.....	Light Green	White
Chromend 20/80	.....	Black	White
Nickelend	Nickel	Grey	Orange
Chromend 2M	2% Cr.—Mo.	.....	.....
Manganend 2M(S)	Special	Grey	.....
Chromend 5M	502	Grey	Blue
Chromend 12	410	Grey	Brown
Chromend 16	430	Grey	Green
Chromend 18	442	Grey	Red
Chromend 28	446	Orange	Yellow
Mixend	Monel	Orange	Blue
Reformend	M. S. for C. I.	Orange	.....
Manganend 13	13% Mn. Steel	.....	Red
Bronzend E	Everdur	.....	.....
Bronzend P	Phos. Bronze	.....	.....
Carend	Mild Steel	.....	.....

Note:—Type numbers are those of the American Iron and Steel Institute. The weld metal analysis nearest to that specified by A.I.S.T. is the one here used for reference.

NOTE: Where the grade name indicates analysis, the first figure is the % Chromium and the second figure is the % Nickel. (For instance, Chromend 20/80 is 20% Cr. and 80% Ni.)

A copy of this chart may be obtained from Arcos Corporation or any of their distributors listed below.

ARCOS CORPORATION 401 N. BROAD ST., PHILADELPHIA 8, PA.

Distributors Warehouse Stocks in the Following Cities:

Borger, Texas.....Hart Industrial Supply Co.
Boston, Mass. (Belmont), H. Boker & Co., Inc., W. E. Fluke
Buffalo, N.Y.....Root, Neal & Co.
Chicago, Ill.....Machinery & Welder Corp.
Cincinnati, Ohio.....Williams & Co., Inc.
Cleveland, Ohio.....Williams & Co., Inc.
Columbus, Ohio.....Williams & Co., Inc.
Detroit, Michigan....C. E. Philips & Co., Inc.
Erie, Penna.....Boyd Welding Co.
Fresno, Calif.....Victor Equipment Co.
Ft. Wayne, Ind..Wayne Welding Sup. Co., Inc.
Honolulu, Hawaii.Hawaiian Gas Products, Ltd.
Houston, Texas..Champion Rivet Co. of Texas
Kansas City, Mo..Welders Supply & Repair Co.
Kingsport, Tenn.....Slip-Not Belting Corp.
Los Angeles, Calif.....Victor Equipment Co.
Milwaukee, Wis....Machinery & Welder Corp.
Moline, Ill.....Machinery & Welder Corp.
New Orleans, La.....Wm. D. Seymour Co.
New York, N. Y.....H. Boker & Co., Inc.
Oklahoma City, Okla..Hart Industrial Supply Co.
Pampa, Texas.....Hart Industrial Supply Co.
Pittsburgh, Pa.....Williams & Co., Inc.
Rochester, N. Y.....Welding Supply Co.
San Diego, Calif.....Victor Equipment Co.
San Francisco, Calif....Victor Equipment Co.
Seattle, Wash.....Victor Equipment Co.
St. Louis, Mo.....Machinery & Welder Corp.
Syracuse, N. Y.....Welding Supply Co.
Wichita, Kansas.....Watkins, Inc.

"QUALITY WELD METAL EASILY DEPOSITED"

Ingenious materials handling developments,

revealing unlimited possibilities

for boosting operating efficiency and lowering costs,

grow out of the all-'round

adaptability of **TOWMOTOR**

THE 24-HOUR ONE-MAN-GANG

TOWMOTOR CORPORATION • 1230 E. 152ND STREET, CLEVELAND

STRAIGHT—GAS POWERED INDUSTRIAL TRUCKS EXCLUSIVELY—SINCE 1919

Canadian Fluorspar Mines to Be Worked

Ottawa

• • • **One of Canada's** more serious problems is obtaining sufficient fluorspar to take care of the excessive demands of the steel mills. Special efforts and assistance have been granted by the Canadian government, through the Department of Munitions and Supply, to stimulate fluorspar production.

At this time the government is providing funds for development of several properties, and a few of these are now in the production stage. However, output is still well below requirements. To further stimulate production in this area, Detomac Mines, Ltd., with head office in Northern Ontario Building, Toronto, has been formed and is proceeding with arrangements to open up a property, which previously produced some 800 tons under private management. Fluorspar of 85 per cent grade is now $40 per net ton, f.o.b. Madoc.

Lincoln Says Renegotiation Reduces Production Efficiency

Cleveland

• • • **In an attack** on renegotiation procedures in an effort to have the provisions of renegotiation exempt certain manufacturers, James F. Lincoln, president of the Lincoln Electric Co., Cleveland, stated that renegotiation is "just a $2.00 name for the very old and much used piecework wage cutting." In explaining the similarity, Mr. Lincoln said that experience with piecework wage cutting has been long and costly, and has done much to reduce efficiency of production.

Mr. Lincoln proposed an amendment for consideration by the subcommittee of the House Ways and Means Committee, to the effect that the renegotiation statute shall not apply to any contract or sub-contract for standard commercial products, provided such products:

1. Have a general peacetime use in industry; and

2. Were made or sold by the contractor or sub-contractor prior to Jan. 1, 1941, pursuant to a standard published price list and are now being sold as the same product pursuant to a standard published price list; and

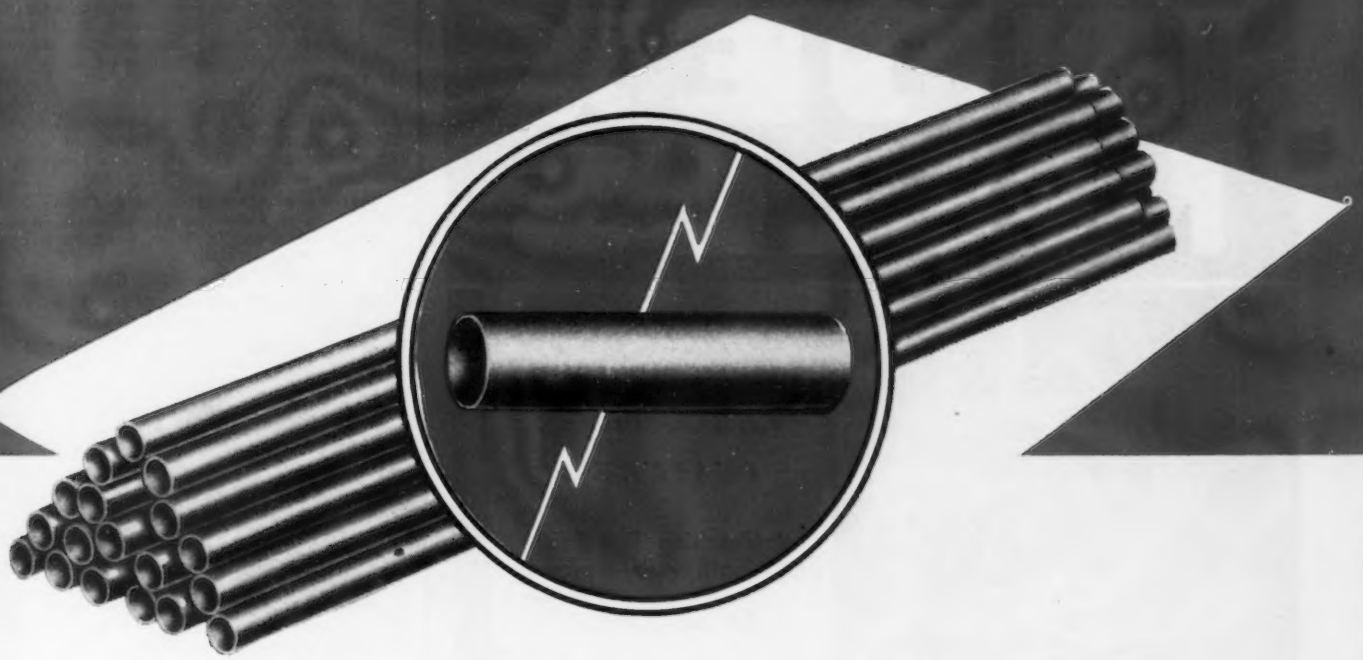
3. Are manufactured or sold by more than one independent manufacturer as a competitive product; and

4. Are sold at standard published list prices equal to the lowest standard published list prices of any manufacturer or seller of the same product; and

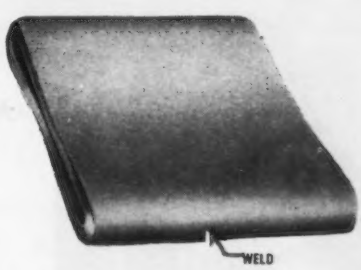
5. Were at the time the contract or sub-contract was made, subject to a ceiling price fixed by a Federal Government Agency.

UNIFORMITY FOR SAFETY...

...with Talon's Electric Welded Steel Tubing



CONTROLLED uniformity of Talon's Electric Welded Steel Tubing begins with the desired chemical and physical specifications of the hot-rolled strip from which it is formed. It assures safety, ease of fabrication, great strength, and low cost. Close gauge tolerances guarantee uniform wall thickness, concentricity, and unvarying light weight. No surface defects are hidden. Both the inside and outside surfaces undergo constant inspection from production of the strip, through the cold-forming operation on the tube mill, to final inspection. Every foot is hydrostatically tested to withstand tremendous pressure. Size is held consistently on long runs of a given diameter by micro-gauge adjustment of the forming rolls. Talon's Electric Welded Steel Tubing is now made in most sizes from ¾" to 4" O. D.—up to 60 feet in length. These and other sizes will be available for your peacetime production at low cost.



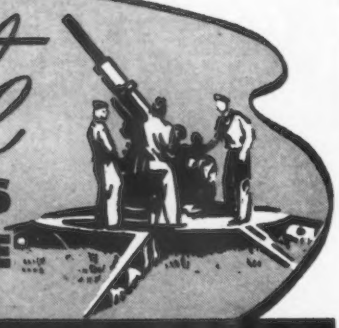
TESTING THE STRENGTH OF THE WELD

Flattening test—with maximum bending at the weld. Talon's Electric Welded Steel Tubing exceeds the permissible limits of all standard tests for physical properties.

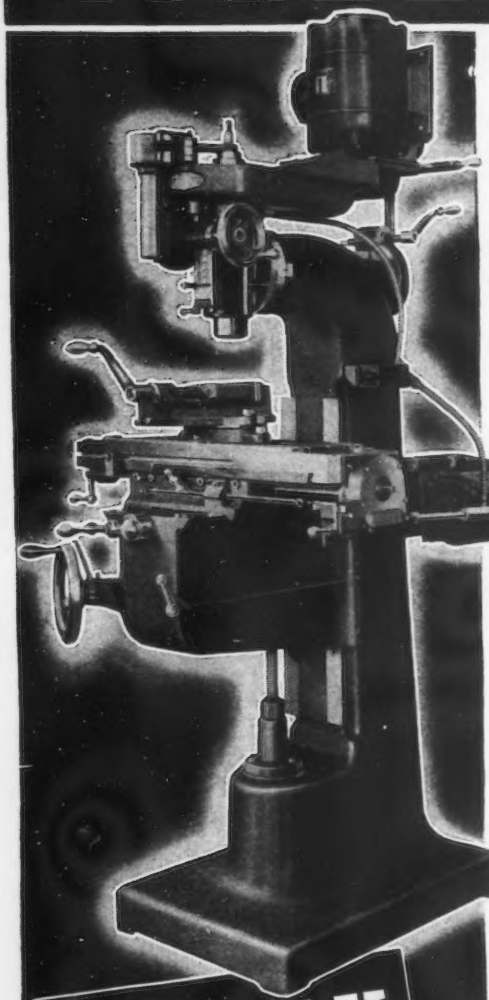
TALON . . INC.

STEEL TUBE DIVISION **OIL CITY, PENNA.**

Accurate
AS THE GUNS
THEY HELP PRODUCE



INDEX
MILLS



Manufactured by Index Machine and Tool Co., Jackson, Michigan.

CHECK THESE FEATURES!

★ Precision Ball Bearing Spindle that will require no attention for two years.

★ Swivel Head which can be set 90° right or left.

★ Super construction sensitive enough to do work with end mills 1/8" diameter yet rugged enough to use 3/4" end mills taking full cuts 24 hours a day.

★ Verniers for locating, and power feed to spindle for boring.

★ A versatile machine that can be used in the tool room or on the production line.

Send inquiries for immediate quotation and quick delivery to Factory Sales and Distributing Agents.

BLANK and BUXTON MACHINERY

3100 E. MICHIGAN AVE.
JACKSON, MICHIGAN

More War Contracts Let By Defense Plant Corporation

Washington

• • • **Defense Plant Corp.,** RFC subsidiary, has authorized the following contracts:

Ford Motor Co., Dearborn, Mich., to provide additional facilities for a plant in Michigan at a cost in excess of $750,000, making a total commitment of more than $3,400,000.

Airesearch Mfg. Co., Phoenix, Ariz., to provide additional equipment at a plant in Arizona at a cost in excess of $70,000, making a total commitment of more than $1,725,000.

Brewster Aeronautical Corp., Long Island, N. Y., to provide additional facilities at a plant in New Jersey at a cost in excess of $90,000, making a total commitment of more than $225,000.

Swiss-American Gear Mfg. Corp., New York, to provide machinery and equipment at a plant in New York at a cost in excess of $55,000.

Ladish Drop Forge Co., Cudahy, Wis., to provide additional facilities at a plant in Wisconsin at a cost in excess of $1,200,000, making a total commitment of more than $10,570,000.

The Maryland Sanitary Mfg. Co., Baltimore, Md., to provide additional facilities at a plant in Maryland at a cost in excess of $150,000, making a total commitment of more than $1,700,000.

Isolantite, Inc., Belleville, N. J., to provide additional facilities at a plant in New Jersey at a cost in excess of $100,000, making a total commitment of more than $1,420,000.

American Radiator & Standard Sanitary Corp., Pittsburgh, to provide additional facilities at a plant in Ohio at a cost in excess of $75,000, making a total commitment of more than $615,000.

Clarke Aero-Hydraulics, Inc., Pasadena, Cal., to provide additional machinery and equipment at a plant in California at a cost in excess of $100,000, making a total commitment of more than $315,000.

Motor Products Corp., Detroit, to provide equipment at a plant in Michigan at a cost in excess of $150,000.

St. Paul Engineering & Mfg. Co., St. Paul, Minn., to provide equipment at a plant in Minnesota at a cost in excess of $90,000.

Wathen Bros. Distillers, Louisville, Ky., to provide plant facilities in Kentucky at a cost in excess of $65,000.

Ford Motor Co., Detroit, to provide additional plant facilities in Michigan at a cost in excess of $3,400,000, making a total commitment of more than $86,000,000.

Champion Machine & Forging Co., Cleveland, to provide additional facilities at a plant in Ohio at a cost in excess of $1,000,000, making a total commitment of more than $4,000,000.

Bell Aircraft Corp., Buffalo, to provide facilities in Vermont at a cost in excess of $2,000,000.

Tycoon Tackle, Inc., Miami, Fla., to provide additional equipment and machinery at a plant in Florida at a cost in excess of $100,000, making a total commitment of more than $450,000.

Basic Chemical Corp., St. Louis, to provide equipment for a plant in Missouri at a cost in excess of $40,000.

Packard Motor Car Co., Detroit, to provide additional equipment at a plant in Michigan at a cost in excess of $2,700,-

KENNAMETAL Get Special tools

IT'S CHEAPER THAN RESHAPING STANDARDS

Grinding down standard carbide tools to shapes for special steel-cutting jobs is an expensive and generally an inefficient operation.

In all tool grinding operations labor must be sufficiently skilled to prevent localized heating of the tool. When special tools are ground the considerations of special rake and cutting edge angles are added.

These factors can be economically controlled by the use of expensive equipment when special tools are ground on a mass production basis, but — very few plants convert enough tools to make this equipment a profitable investment.

When several of these non-standard tools are needed for special production jobs, get the complete tools from the KENNAMETAL plant; when only one or two are required, braze KENNAMETAL formed tips to shanks in your own shop and have the tool on the job cheaper and faster than by reshaping "standards."

Write for your copy of the KENNAMETAL Catalog 43B. It contains detailed information on KENNAMETAL carbide tools and blanks.

KENNAMETAL Inc.

144 LLOYD AVE., LATROBE, PA.

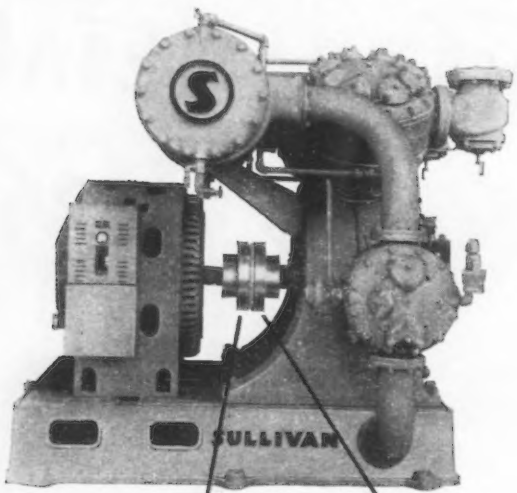
Trade Mark Reg. U. S. Pat. Off.

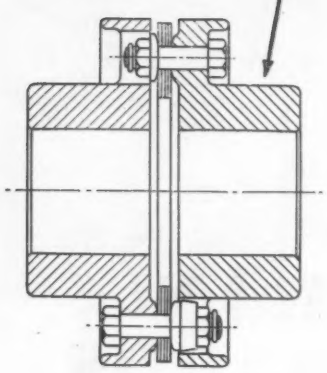
Foreign Sales: U. S. STEEL EXPORT CO., 30 Church St., New York (Exclusive of Canada and Great Britain)

KENNAMETAL THE All American CARBIDE

THOMAS FLEXIBLE COUPLINGS

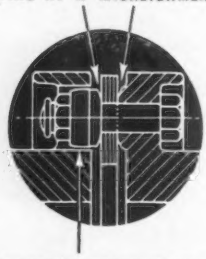
FOR SINGLE BEARING MOTOR DRIVES AND OTHER SIMILAR DRIVES WHERE WEIGHT IS TO BE SUPPORTED





Eliminates One Bearing
Carries Armature Weight
Provides Free End Float
Eliminates Pilot Bearing
Saves Weight . . . . .
Saves Space . . . . . .
No Backlash . . . . .
No Wear . . . . . .
No Lubrication . . . .

THE BEVELED CLAMPING FACES PREVENT THE FLEXIBLE DISCS FROM BREAKING WHEN OPERATING AT A MISALIGNMENT.



CLEARANCE SPACE PROVIDED AT POINT OF ARROW PREVENTS GENERATOR ROTOR FROM FALLING IN CASE OF ACCIDENT...

The above are the essential features for a permanent, carefree installation and are not found in any other make or type of coupling. *Thomas Couplings are standard equipment on Sullivan Compressors.* Write for a new Thomas catalog which shows couplings for all purposes.

THOMAS
FLEXIBLE COUPLINGS

THOMAS FLEXIBLE COUPLING CO.
WARREN • PENNA.

000, making a total commitment of more than $48,000,000.

National Distillers Products Corp., New York, to provide additional plant facilities in Missouri at a cost in excess of $1,850,000, making a total commitment of more than $4,000,000.

Associated Iron & Metal Co., Oakland, Cal., to provide plant facilities in California at a cost in excess of $60,000.

Trade Notes

Cochrane Corp., Philadelphia, has appointed Roy L. Stone flow meter representative for the Rochester and Buffalo district.

•

McKenna Metals Co., Latrobe, Pa., has been succeeded by Kennametal, Inc., of the same city. The personnel and management remain the same.

•

Atlas Powder Co. has awarded the contract for construction of a new research laboratory at Atlas Point, Del., to the Turner Construction Co.

•

Intercontinent Aircraft Corp. began operations in June as the Miami Division of Consolidated Vultee Aircraft Corp.

•

The Exolon Co. has moved to East Niagara Street, Tonowanda, N. Y.

•

Empire Solvents Corp., New York, has appointed the Edward F. Berry Co., Detroit, as their Michigan representative.

•

Interchemical Corp. has moved to new offices in the Empire State Building, New York.

•

Worthington Pump & Machinery Corp., Harrison, N. J., has acquired the Ransome Machinery Co., Dunellen, N. J., as a subsidiary.

•

H. M. Harper Co., Chicago, has opened a branch office at 1617 Pennsylvania Blvd., Philadelphia.

•

Dow Chemical Co., Midland, Mich., has opened a branch office in the Terminal Tower Bldg., Cleveland.

•

B. D. Saklatwalla, metallurgical consultant, has moved his Pittsburgh offices to the Park Bldg., Pittsburgh.

•

J. J. Siefen Co., Detroit, has dissolved its partnership and has been incorporated in the state of Michigan. Officers are: J. J. Siefen, president; John F. Siefen, vice-president; D. A. Gaines, secretary; I. E. Siefen, treasurer.

•

Farris Engineering Co., Ridgefield, N. J., announces the establishment of a new division to handle valve repairs.

•

Florez, Phillips & Clark, division of the Visual Training Corp., Detroit, is a newly-formed advertising and marketing agency.

•

North American Philips Co., Inc., Dobbs Ferry, N. Y., announces a new trademark "NORELCO", which will now be applied to products handled by its Industrial Electronics Division at 419 Fourth Avenue, New York.

•

Columbia Axle Co., Cleveland, has bought the property of the Karos Tool & Mfg. Co., Detroit, for $67,100.

•

Marco Chemicals, of Philadelphia, announces the transfer of its business to Marco Chemicals, Inc., a New Jersey corporation, with Irving E. Muskat as president.

•

Buffalo Foundry & Machine Co. has purchased the industrial kettle business of the Sowers Mfg. Co., whose plant and equipment was offered for sale July 20, in Buffalo at a public auction.

•

Acme Machine & Tool Co. has been organized by I. V. and C. Brossell and John Kader.

•

The Mills Novelty Co. has changed its name to Mills Industries, Inc.

.0001" Tolerance on 4 Sides

In one modern Pennsylvania plant, keys ranging in size from ¼ to 1⅛" wide and from ⅛ to ⅜" thick were ground to give a .0001" tolerance on 4 sides over all. There was only 1 reject in 2500 pieces.

THE DO-ALL HAS EVERYTHING

Here's a direct drive Surface Grinder with 1140 square inches of hand scraped bearings and mechanism safely sealed inside. A magnetic chuck holds work firmly without clamps. Vibration is practically nil because the DO-ALL is sturdily built—weighs more than a ton. Adaptable to wet or dry grinding. Comes in two models.

You'll like the DO-ALL—it's easy on the operator, easy on the work and easy on your budget. It will turn out super-smooth jobs for you in quick time and has a ruggedness that will stand the gaff of continuous operation long after other equipment has given up the ghost.

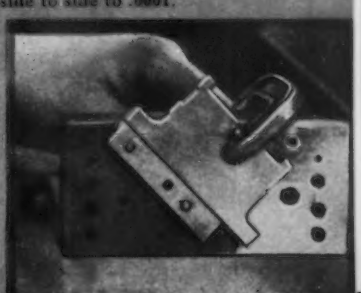
Send for data about the two DO-ALL models.

SAVAGE TOOL COMPANY

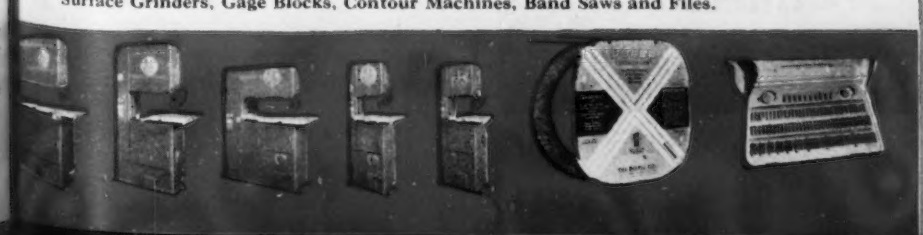
DEPT. RA, SAVAGE, MINN.

DO-ALL Offices in 25 cities, with a staff of trained engineers to give you quick service on Surface Grinders, Gage Blocks, Contour Machines, Band Saws and Files.

A Boring Cutter ground on the DO-ALL. Two cutting edges ground to .001. Clearance and step-down ground to .002. Keyway ground from side to side to .0001.



Fixture used to hold the Boring Cutter to 45° angle, tolerance held to .001.



Report Reveals Record Breaking Canadian Base Metal Output Figures

Toronto

• • • **Canada is now topping** all previous records in the production of base metals. While figures for 1942 are impressive, those for 1943 will be better, due to further expansion in nickel production and larger output of nickel and copper, some of which is from new producers. The remarkable advance in base metal output has not been secured without sacrifice on the part of established producers. Certain major deposits have been mined at a rate which is abnormal and reserves have been seriously depleted. It should not be forgotten that Canadian mines have devoted their entire attention to providing the Allied Nations with essential metals, at prices which have no relation to wartime levels. Apart from a few concessions with respect to writeoffs on new plant construction Canadian base metals industry has been providing supplies at price levels almost identical with those which prevailed before the war.

Canada's aggregate refined production of copper, nickel and zinc for 1943 is estimated at 827,800 tons, as against 662,100 tons for 1939, the Wartime Information Board states in the July issue of *Canada at War*. Canada is now producing 95 per cent of the combined nickel output of the United Nations; 20 per cent of the zinc output; 12½ per cent of the copper output; 15 per cent of the lead output; 75 per cent of the asbestos output and 20 per cent of the mercury output.

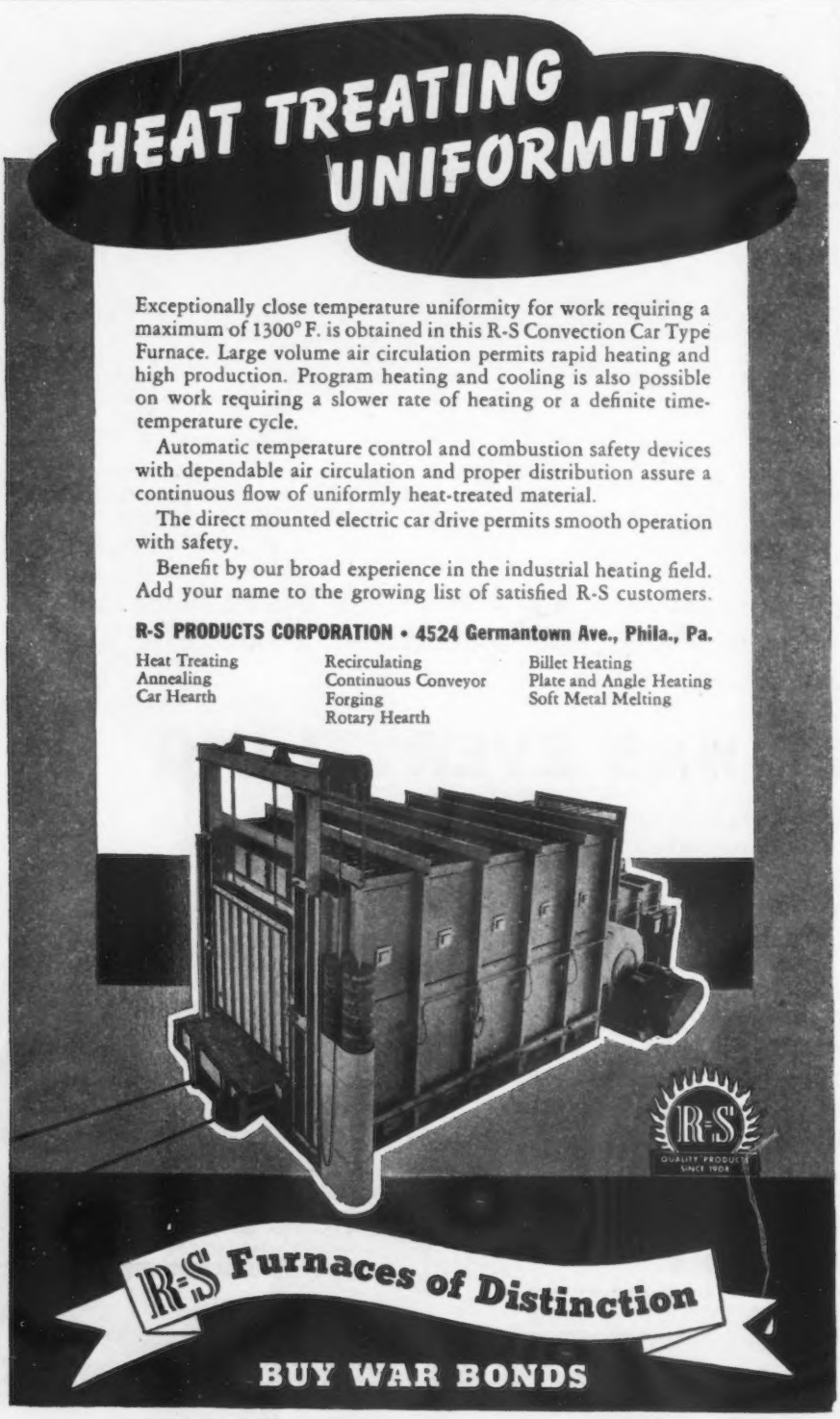
For the first time since 1939, the government has made known production figures on base metals, which are as follows:

	1942 Tons	1939 Tons
Refined copper	270,600	232,000
Refined lead	243,800	191,900
Refined nickel	93,300	64,500
Refined zinc	216,000	175,600

Canada is the greatest base metal exporting country in the world, and this year its output will attain the highest peak in history, the government publication says. This has been achieved by an enormous expansion of the aluminum industry, development of a Canadian process for the production of magnesium, extension of recovery methods at large base metal mines, revival of old mines and exploitation of new marginal and sub-marginal deposits.

The aluminum industry provides possibly Canada's most spectacular story of wartime expansion. The Canadian output is more than six times that of 1939, is more than the total output of the rest of the world in 1939, and is supplying about 40 per cent of the war requirements of the Allied Nations; yet the demand is now so great that 18,000 lb. is required for one large bomber, and civilian curtailment will continue until the war is over.

Efforts have been made to stimulate production of tin, tungsten, molybdenum, mercury, chrome and manganese; and where necessary to build up stock piles of imported metals.


HEAT TREATING UNIFORMITY
Exceptionally close temperature uniformity for work requiring a maximum of 1300° F. is obtained in this R-S Convection Car Type Furnace. Large volume air circulation permits rapid heating and high production. Program heating and cooling is also possible on work requiring a slower rate of heating or a definite time-temperature cycle.
Automatic temperature control and combustion safety devices with dependable air circulation and proper distribution assure a continuous flow of uniformly heat-treated material.
The direct mounted electric car drive permits smooth operation with safety.
Benefit by our broad experience in the industrial heating field. Add your name to the growing list of satisfied R-S customers.
R-S PRODUCTS CORPORATION • 4524 Germantown Ave., Phila., Pa.
Heat Treating
Annealing
Car Hearth
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Forging
Rotary Hearth
Billet Heating
Plate and Angle Heating
Soft Metal Melting
R-S
QUALITY PRODUCTS SINCE 1908
R-S Furnaces of Distinction
BUY WAR BONDS

Remember it? The dim vision of masks and gowns, of lights and gleaming things? They were phantom glimpses in a troubled dream, the night your life was saved — fragments of a shining world of science and strange skills . . .

And every appliance, every gleaming instrument — every sterile garment, swab and bandage — every accessory and apparatus there in the room, that night — was the product of machine tools, or was processed on equipment built by machine tools.

From giant hydraulic presses to the finest internal grinding machines, literally hundreds of machine tools played a part, the night your life was saved.

And of all those unseen instruments that helped to save your life that night, none is more basic to the creation of *everything* that affects your life today than the internal grinding machine.

Bryant Chucking Grinder Company

Springfield, Vermont, U. S. A.

Brazil, with Bauxite Reserves and Power Sources, Seeks Aluminum Industry

• • • **In need of aluminum for her growing aircraft manufacturing industry, Brazil is aiming to use more extensively vast deposits of bauxite. Besides bauxite, Brazil has large potential sources of hydro-electric power. Together, bauxite and power form a natural basis for the development of the aluminum industry.**

Establishment of a Brazilian aluminum industry has been held up by the difficulty of obtaining equipment, in view of the expansion of light metal industries in North America for war needs, according to the Office of the Co-ordinator of Inter-American Affairs.

Nevertheless, Brazilian industrialists envisage a coming day when the combination of great bauxite deposits and electric power resources will enable Brazil to have a substantial aluminum industry. Since 1940, in face of the demand for aluminum from war industries in Europe and North America, Brazil has been deprived largely of her former imports, although they amounted to less than 2,000 tons annually.

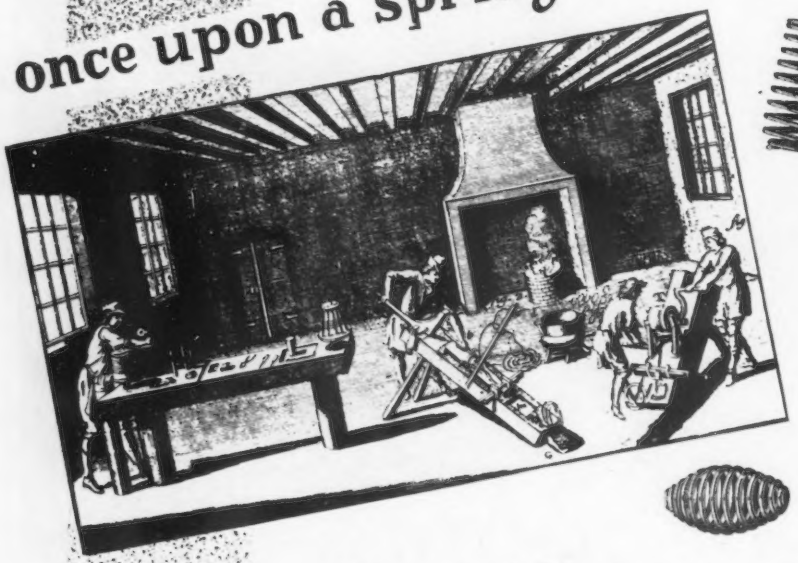
Brazil's known bauxite deposits are estimated to total 150,000,000 tons. The largest is located near the health resort of Pocos de Caldas, in the state of Minas Geraes, and is estimated to contain 120,000,000 tons of high metallic content.

Commercial exploitation of these ores for export has lagged partly because of the competition from bauxite deposits in Dutch and British Guiana, source of much of the bauxite used by North American industry.

Brazil hastened her plans for establishment of a domestic aluminum industry after the start of the war in Europe in 1939, but was unable to get plants completed before Pearl Harbor.

Meanwhile, with United Nations' war needs getting first call on equipment for expansion, Brazil has encountered delay in realizing hopes of utilizing the bauxite and power resources nature has given her. Still Brazil has gone ahead with planning.

once upon a spring-time...



Making wire the "beech wood" way as is the central figure in this 18th century illustration must have been hard work.

Imagine trying to make two springs *exactly alike* from wire produced thus.

But with modern wire and a Torrington Spring Coiler identical, extremely accurate springs are practical. Absolutely uniform tension, length and diameter at high production speeds can be maintained by any professional springmaker so equipped.

No. 3 of a Series.

THE TORRINGTON
MANUFACTURING COMPANY
TORRINGTON, CONNECTICUT

ANOTHER CARRIER LAUNCHED: The USS Bataan takes to the water at the yards of the New York Shipbuilding Corp., Camden, N. J.

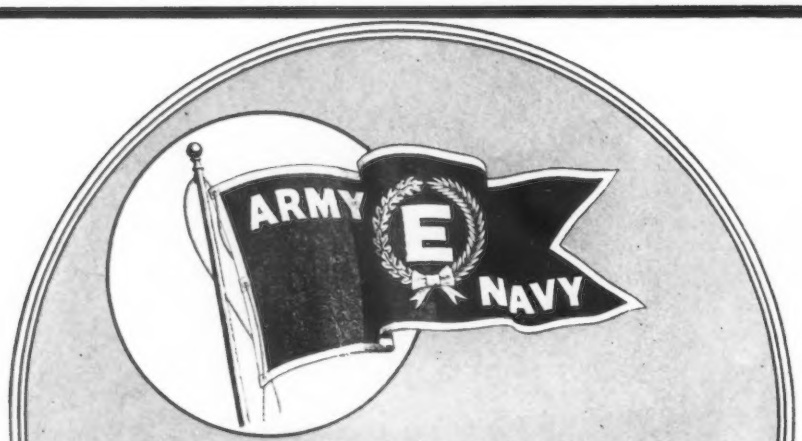
Press Association, Inc.

Ribbon of HONOR

Together with our vital military manufacture of SuVeneer* Clad Metal runs the less-spectacular production of stainless and special alloy strip for aircraft and other essential war industries. Maintaining the superfine quality of these ribbons of steel is a point of honor today as in every year of this Company's progress.

*Trademark Reg. U. S. Pat. Off.

Superior Steel
CORPORATION
CARNEGIE · PENNSYLVANIA



THE METAL SPECIALTY CO.

". . . for outstanding production of War Materials—this award is your Nation's tribute to your efforts and great work in backing up our soldiers on the Fighting Fronts."

James V. Forrestal
UNDER SEC'Y OF THE NAVY

fulfilling exacting requirements for

INDUSTRY

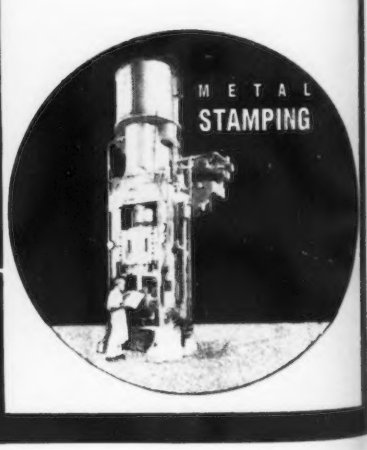
in

PLASTIC MOLDING *and* METAL WORKING

Drawing · Coining
Rolling · Forming
Stamping · Welding

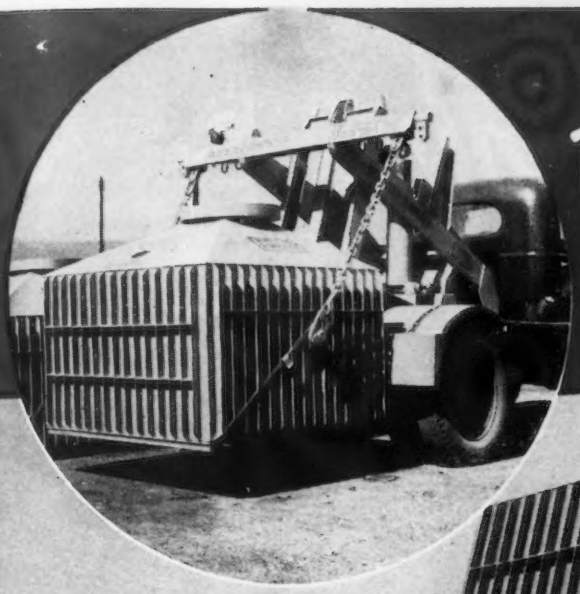
Metal Specialty's plants are equipped to render you complete service in the fabrication of all Metal Parts, and in Plastic Injection Molding up through 18 ounces per shot. Along with 850-ton self-contained hydraulic presses for Metal Working, Metal Specialty has one of the four 18-36 ounce capacity injection presses for Custom Molding together with full complementary equipment.

Assembled Jobs · Pressed Metal to Order

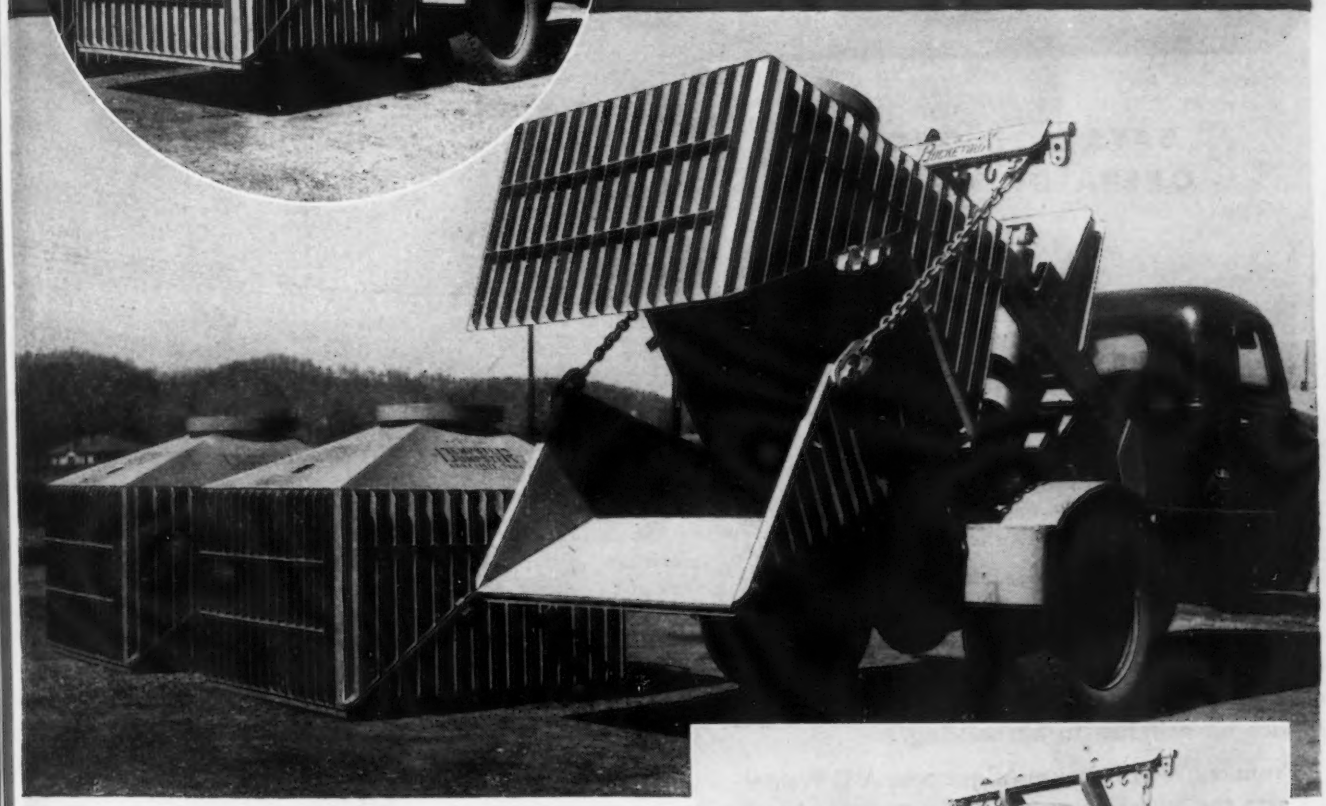


The METAL SPECIALTY *Co.*

MAIN OFFICE AND PLANT • ESTE AVENUE • CINCINNATI, OHIO



THIS truck has Thirty ENGINEERED bodies



Another Dempster Development For Industrial Materials Handling

★ Here is another typical example of the results of cooperation between our engineers and those of industrial plants with difficult material handling problems. In this case, we worked with a leading Western chemical plant in adapting the Dempster-Dumpster and its many advantages to hauling and dumping high temperature furnace residue.

Nothing ordinary about these bodies . . . they're built scientifically to withstand the intense heat of 1500° F. Hauling such material on a truck will be news to many. Note the fins on bodies for dissipating heat while in transit.

No stretch of the imagination is necessary for any industrial plant man to realize the tremendous savings in trucking equipment, tires, gas, manpower and time, when he knows that one truck, equipped with a Dempster-Dumpster Hoisting Unit, will service 30 of these bodies of 4 cu. yd. capacity each. Loaded bodies are hoisted to carrying position, hauled, dumped and returned to position under full control from driver's seat.

This is only one of many types of bodies we have developed for use with the Dempster-Dumpster system of materials handling for speeding up production, saving time, equipment, and manpower, for many busy industrial plants throughout the nation. The chances are you need it too.

DEMPSTER DUMPSTER
TRADE MARK REG.

Dempster Brothers, Inc., 883 Springdale, Knoxville, Tennessee

A REAL WORK-MOVING

"Jack-of-all-jobs"

Paul Ehrhardt, Ehrhardt Welding Co., McKeesport, Pa., welds for Victory during the day... teaches welding at night on his Westinghouse All-purpose A-C Welder.

SAYS JOB SHOP OPERATOR OF HIS

A-C WELDER

Like most every other job shop operator, Paul Ehrhardt is swamped with jobs he never did before. Things people used to throw away, he now welds for further service . . . tractor cleats, sprockets, gears, housings, levers, lawn mower parts, etc. In addition, he fabricates parts for war industry, and at night teaches welding . . . a schedule that leaves no leeway for gadget-fussing or time out for maintenance. For that kind of service he switched to a-c welding.

From his Westinghouse All-purpose A-C Welder he gets the speed he needs—20% to 30% faster welding. He has no arc blow or maintenance to contend with, and he can turn out consistently better welds. Add to that, ample capacity for all types of job shop work, lower first and operating costs, simplicity of control, availability, and you have Mr. Ehrhardt's reasons for selecting the Westinghouse A-C Welder.

Before adding to or replacing present equipment in your shop, look into Westinghouse A-C Welders. Ask your Westinghouse Distributor or write for A-C Welding Booklet B-3136, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., Dept. 7-N.

J-21279

EXAMPLE:

FABRICATES war products... makes vacuum-tight welds on housings for vacuum systems using Westinghouse DH and SW electrodes.

EXAMPLE:

MAINTAINS vital equipment. Hard-facing tractor cleats with Westinghouse Hardentough electrodes lengthens cleat life 3 to 5 times.

EXAMPLE:

REPAIRS cast steel bulldozer drive sprockets. Break was burned out, pre-heated and welded with Westinghouse FP electrodes.

Westinghouse

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

A-C WELDERS

252 U.S. Mines Supplied Iron Ore in '42

• • • **Demand for** raw materials by the steel industry in 1942 resulted in a record year in the iron ore industry. According to the Bureau of Mines, United States Department of the Interior, a total of 118,189,336 short tons of usable iron ore was produced during the year. United States iron mines produced a total of 141,710,416 tons of crude iron ore during 1942 and shipments amounted to 142,010,365 tons. Of this quantity, 49,936,613 tons were shipped to beneficiation plants, and 92,073,752 tons were shipped direct to consumers. A total of 25,917,959 tons of beneficiated ore was produced at milling plants in addition to 720,172 tons of by-product cinder and sinter from the pyrite industry. Output in 1942 came from 252 mines of which 35 mined over 1,000,000 tons of crude ore. Seventeen states were active producers in 1942 compared with 20 in 1941. Minnesota with 82,809,939 tons supplied 70 per cent of the usable ore and Michigan with 17,499,060 tons, or 15 per cent, was the second largest producer. These two states and Wisconsin (1,682,897 tons or 1 per cent) constitute the Lake Superior region, which supplied 86 per cent of the domestic output. About three-fourths of the iron ore mined in 1942 came from open-pit mines.

Domestic production of pig iron, exclusive of ferro-alloys, increased 7 per cent in 1942 over 1941 and established a new record. The total output of pig iron in 1942 amounted to 59,077,593 short tons. Pennsylvania was the largest producer of pig iron in 1942 with 31 per cent of the total; Ohio ranked second with 22 per cent.

Shipments of pig iron, exclusive of ferro-alloys, increased 7 per cent in quantity and 10 per cent in value in 1942 over 1941. These shipments totaled 59,100,601 short tons valued at $1,227,389,689. The values given represent the approximate amounts received for the iron f.o.b. furnaces and do not include freight costs, etc.

Shipments of usable ore from mines totaled 118,707,133 short tons in 1942. Of this quantity, 91,972,925 tons or 77 per cent was direct shipping ore for iron and steel furnaces. Also included in the total shipments are 74,036 tons for cement manufacture, 29,424 tons for paint and 34,842 tons for miscellaneous uses. Shipments and values of by-product ore for iron and steel furnace use are included for the first time in 1942. These shipments totaled 755,844 tons in 1942 valued at $3,237,511.

In 1942 a total of 25,917,959 short tons of beneficiated ore was produced from 49,936,613 tons of crude ore. Beneficiation of iron ore was reported at 120 mines in 9 States in 1942, compared with 112 mines in 8 States in 1941. Beneficiated ore shipped from domestic mines in 1942 increased 19 per cent over 1941; concentrates comprised 19 per cent of total usable ore shipments, and sinter comprised 3 per cent.

The average value per short ton of usable iron ore at the mine was $2.35 in 1942, compared with $2.40 in 1941.

Average value per short ton of usable iron ore at mines in the United States in 1942

(*Exclusive of ore containing 5 per cent or more manganese*)

STATE	DIRECT			CONCENTRATES			Sinter	Pyrite cinder and sinter
	Hematite	Brown ore	Magnetite	Hematite	Brown ore	Magnetite		
Alabama	$1.83	.....	.....	*	$2.23	.....	*	.....
California	2.09	.....	*	.....	.....	.....	.....	.....
Georgia	*	.....	.....	.....	2.14	.....	.....	.....
Michigan	2.52	.....	.....	.....	*	.....	.....	.....
Minnesota	2.14	.....	.....	$2.15	.....	.....	$2.23	.....
Missouri	4.19	*	.....	.....	*	.....	.....	.....
New Jersey	.....	.....	*	.....	.....	$5.26	.....	.....
New Mexico	3.86	.....	$2.56	.....	.....	.....	.....	.....
New York	*	.....	*	.....	.....	4.08	6.57	.....
Pennsylvania	.....	.....	*	.....	.....	.....	.....	.....
Wisconsin	2.27	.....	.....	.....	.....	.....	.....	.....
Other †	4.02	*	2.99	.....	*	.....	.....	.....
Average all States	$2.24	$2.66	$4.52	$2.17	$2.36	$4.62	$4.10	.....
By-product cinder and sinter ‡	.....	.....	.....	.....	.....	.....	.....	$4.28

* Less than 3 producers; permission to publish value not given.
† Includes Arizona, Texas, Utah, Virginia, Washington, and Wyoming.
‡ Pyrite cinder and sinter; produced in Delaware, Michigan, Pennsylvania, Tennessee, and Virginia.

WESTINGHOUSE WELDERS FOR JOB SHOP WORK

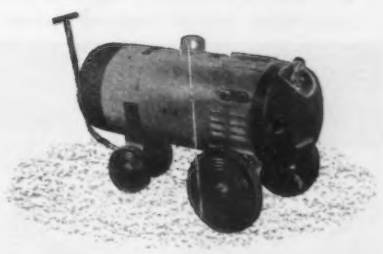
4 ways to better welding

FOR SHOP MAINTENANCE AND LIGHT WORK

Model WT-1C—100 amperes. Current range, 20 to 140 amperes. Built-in capacitor (optional). Built-in breaker protection. Easy to move.

ALL-PURPOSE WELDER

Model WT-4C—200 amperes. 27-step current adjustment from 20 to 250 amperes permits using wide variety of electrodes. Built-in capacitor (optional) and Nofuze "De-ion" Circuit Breaker.



NEW D-C WELDER WITH ARCONTROL

Single, pre-set current adjustment. Lots of capacity to handle all kinds of work. No drop-off after warming up. Simple adjustments. 200, 300 and 400-ampere models.

COMPLETE LINE OF WELDING ELECTRODES

Westinghouse electrodes are designed for fast production of high-quality welds with a-c or d-c on carbon steels, cast iron, stainless and alloy steels, sheet metal and special applications. Strike easily and have high deposition efficiency.

★ ★ ★

Write for latest a-c and d-c welding literature. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., Dept. 7-N. J-21279

Westinghouse

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

WELDERS

Iron and Steel Output in Canada Fail to Maintain 1942 Production Pace

Toronto

• • • **Production** of iron and steel in Canada in the first half of 1943 failed to maintain the high rate attained in the corresponding period of 1942. The downward trend commenced in January of this year when the steel mills at Sault Ste. Marie, Ont., and Sydney, N. S., were closed for two weeks on account of labor strikes. Necessary furnace repairs that have been underway at the various mills since have contributed to the reduced production.

For the first six months of this year pig iron production totalled 867,789 net tons, which is 11 per cent under the 974,000 tons reported for the same period last year, but is 23.8 per cent above the 700,616 tons produced in the first half of 1941, according to figures released by the Dominion Bureau of Statistics. Production for the period under review included 704,695 tons of basic iron of which 677,872 tons were for further use of producing companies and 26,823 tons for sale; 76,594 tons of foundry iron and 86,500 tons of malleable iron, all the latter two grades being for sale. Blast furnace changes included 1,586,853 tons of iron ore, 375,200 tons of limestone, 784,408 tons of coke and 57,347 tons of scrap iron and steel.

For the month of June pig iron output dropped to 147,889 tons against 154,746 tons in May and 167,961 tons in June, 1942. During the month 93.3 per cent of total capacity was used, with 11 out of 12 blast furnaces blowing.

Steel production in the six months ending with June totalled 1,449,153 net tons, a fairly large decline from 1,559,238 tons reported for the same period a year ago, but was 16.5 per cent greater than the 1,286,246 tons produced in the first half of 1941. Production included 1,416,607 tons of steel ingots and 82,546 tons of castings. Charges to steel furnaces included 752,031 tons of pig iron, 474,302 tons of scrap of consumers' own make and 429,352 tons of purchased scrap.

In the month of June output of steel ingots and castings totalled 239,501 net tons, and included 228,476 tons of ingots and 11,025 tons of castings, which compares with 271,737 tons produced in May and 254,163 tons in June last year.

Production of ferro-alloys in the first half of this year showed little change from the corresponding six months of 1942, standing at 111,793 and 107,843 tons respectively and compares with 98,426 tons in the first six months of 1941.

For June output totalled 18,151 tons compared with 17,971 tons in the previous month and 14,664 tons in June, 1941.

Pocket Manual of Arc Welding

• • • **The Industrial Publishing Co.**, 812 Huron Road, Cleveland, has brought out the "Pocket Manual of Arc Welding." Edited by Clayton Herrick, it contains over 70 diagrams, tables and illustrations. The price is 50c. each with a discount of 10 per cent for quantities of over 25 copies on any single order.

HOW TO TRAP GREMLINS IN SPRINGS

IN A CLUSTER of draftees, in a barrel of apples, in a clip of shells, in a batch of springs . . . in *every* quantity made by nature or man . . . there are variations from any chosen standard. What those variations are and why they occur it is often important to know. When springs run into millions, *statistical control* must be exercised to bring the largest possible portion within the desired specifications. Statistical control of springs uncovers the gremlins of quality and production, detects underlying causes for variations, controls or eliminates them, anticipates changes in quality. In the example below, a sample lot of springs was tested for load and length and readings noted. From the results a frequency curve of variations and a "skyscraper" chart were prepared. The height and location of the "Skyscrapers" show how many, and how much springs vary from given specifications. Statistical control is every-day work at Hunter, a matter-of-fact part of insuring the ONE right spring for your job.

Varied and interesting answers to the problem presented in our last advertisement have been received. For those interested, the correct answer is R_1 4.58; R_2 2.92; R_3 .42; R_4 2.08.

AT YOUR COMMAND — *Send your orders, we'll produce them if they're for essential equipment. Write, wire or telephone. Springs designed and made to your specification or ours.*

HUNTER
Science in Springs

HUNTER PRESSED STEEL COMPANY, LANSDALE, PENNSYLVANIA

GOVERNMENT "SPECS" for STAINLESS STEELS

NEW!

Revised Frasse Data Chart Now Available . . .

Incorporating all recent corrections and additions, this new Frasse Data Chart enables you to identify latest Government "specs" for stainless steels at a glance.

It shows the chemical analysis requirements for each Army, Navy, Aeronautical, and Federal specification, together with nearest commercial equivalents in A.I.S.I. standard type numbers. Especially valuable are brief descriptions of the various subclasses under each "spec" number.

The chart is handy file size, printed on tough stock, and suitable for wall or desk use. If you're working to Government stainless steel "specs", you'll find it invaluable. Just send in the coupon—a copy will be sent to you by return mail.

A REMINDER—in cooperation with W. P. B. The need for cutting tool conservation is urgent. If there is no comprehensive plan in your plant, start one today!

Frasse **Mechanical and Aircraft STEELS**

PETER A. FRASSE AND CO., INC. 1
17 Grand St., New York 13, N.Y.

Please send me a copy of your latest Frasse Data Chart, Section A, No. 2, showing Government "specs" for stainless steels and corresponding commercial designations.

NAME .....

FIRM .....

ADDRESS .....

SEAMLESS MECHANICAL AND AIRCRAFT TUBING • COLD FINISHED BARS • ALLOY STEELS • AIRCRAFT STEELS
STAINLESS STEELS AND TUBING • COLD ROLLED STRIP AND SHEETS • WELDED STEEL TUBING • DRILL ROD

Dispersal of Aircraft Industry In Britain Due to Bombings Described

• • • **Changes in the British** aircraft industry brought about by the once heavy bombings by the Nazis and proximity to the fighting fronts which permit rapid adjustment of aircraft to meet conditions of battle, were described by J. Carlton Ward, Jr., president of the Fairchild Engine & Airplane Corp. and a member of the American aircraft industry mission to Britain last year, upon his return to this country.

At the time of Munich in 1938, Britain is reported to have had only three modern types of military aircraft and only enough of these to make up two fighter squadrons. Since that time the huge growth of Britain's aircraft industry has produced innumerable types of fighting aircraft including six different models of the Spitfire and 11 models of the all-wood Mosquito Bomber.

A most interesting feature of the British aircraft industry's evolution since the beginning of the war has been its dispersal and movement underground caused primarily by the Luftewaffe's persistance. The War Damage Emergency Service, established to salvage and recondition bombed factories has concentrated on dispersing bombed plants over wide areas—in many cases taking over garages, private homes, skating rinks, auditoriums and theatres to create individual units of what had formerly been a single factory. In some instances a factory may be dispersed over a 30-mile triangle.

Also as a means of escaping bomb damage to aircraft and other highly essential plants the British have resorted to underground factories, according to Mr. Ward's account. One factory, moved to subterranean quarters, employs between 3000 and 4000 workers in two parallel subway tubes 7½ miles long. About 70 per cent of the workers in this plant are women, he said. Another factory of about 1,500,000 sq.ft. is constructed in a stone quarry about 100 ft. below ground. Still another factory of about the same size has been built into a hill side in sheep raising country and looks from the air like a farm.

How to make POLISHING WHEELS Last Longer!

- If possible have one or two experienced men set up all polishing wheels.
- Maintain an even temperature of about 80 degrees in set-up room to keep the best adhesive qualities in glue or cement.
- If using glue, use a high quality glue, preferably a "first-run" hide glue. Prepare glue carefully according to directions issued by your grain supplier.
- Clean the face of the polishing wheel with an abrasive brick. (New wheels should be trued up in a lathe to raise a nap.)
- Pre-heat wheel and abrasive grain to about 125 degrees F. Never boil glue. Apply it at a temperature of about 135 degrees F.
- Apply abrasive to prepared wheel either mechanically or by hand but in any case see that the wheel is rolled firmly and uniformly in the abrasive.
- The temperature in the dry room should be about 85 degrees and humidity at about 50 percent.
- In use, maintain proper wheel speed—7500 surface feet per minute for glue wheels and up to 9000 surface feet per minute for wheels set-up with cement.

Uniformity of the abrasive grain used in polishing wheels is most important, so insist on LIONITE Abrasive Grains. Rigid controls and Laboratory tests throughout the entire process of manufacture insure maximum uniformity from lot to lot. LIONITE comes in grades and sizes to fit every polishing requirement.

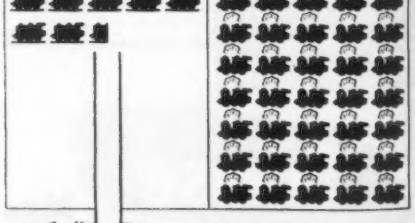
GENERAL ABRASIVE CO., INC.
NIAGARA FALLS, NEW YORK, U.S.A.

The British and Allied air forces are smashing the Fascists' railway systems in Western Europe

EACH SYMBOL EQUALS 10 LOCOMOTIVES

12 months average output of the great Fives-Lille locomotive works

Locomotives shot up by one R.A.F. fighter group alone in 9 months



On January 13th 1943 the United Nations air forces made the third heavy attack in 3 months on the Fives-Lille works. Photographs show that hardly a building was left undamaged.

January 1943—OVER 100 TRAINS AND 50 LOCOMOTIVES WERE ATTACKED IN 30 DAYS

PHOTO COURTESY THE HOSDREG CO., INC., HUNTINGTON, INDIANA

SHE'S GINNY CLOSE—21 years old—95 pounds—married—member of the 10% Club—she's a WOW*. In fact she's the smallest multiple spindle automatic lathe operator in the world.

But she holds a more important record—2286 shells produced in 8 hours with the help of her 8-spindle Conomatic. She does her own tool setting, loads the machine with stock, beats the boys at their own game, then takes care of her six room house, and feeds 100 chickens and a farmer husband.

The Hosdreg Company is pretty proud of Ginny, with her cheerful attitude and happy smile—and also proud of their Conomatics, with their easy operating features and outstanding production capabilities. Get a WOW like Ginny and a Conomatic on the job, and you're bound to break more than one record!

*Woman Ordnance Worker

CONE Automatic Machine Company, Inc., Windsor, Vermont

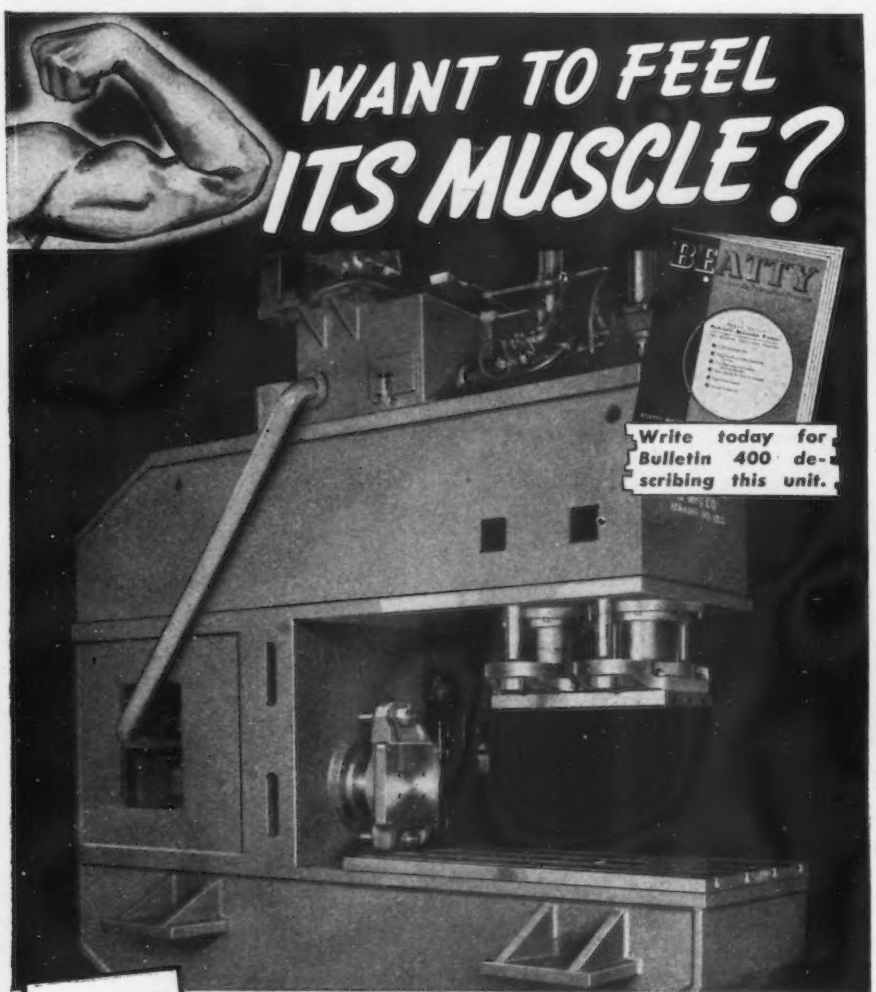
Foundry Wage Rates in Three States Set

Cleveland

• • • **Sound and tested** going rates for key job classifications in the ferrous and non-ferrous foundries in about 45 labor market areas of Ohio, Kentucky and West Virginia have been established by the Regional War Labor Board. These rates represent the maximum which will be approved by the board except in accordance with the "Little Steel" formula or in rare and unusual instances in which critical needs require special consideration.

Specific rates were determined for Cincinnati, Columbus, Cleveland and Toledo, each of which maintained a 5-cent differential over the other. In other areas where common labor rates have been set, the rates for other foundry classifications are determined by interpolation on the basis of the common labor maximum. For example, the foundry rates for Cincinnati, which has a common labor rate of 60c. per hr., will be applicable to other cities with the same common labor rate. Common labor rate for Lorain, Ohio, was fixed at 70c. per hr. In cities where common labor rates have not been announced the WLB is using a tentative rate of 50c. per hr. for Kentucky, 55c. per hr. in West Virginia, and 60c. per hr. in Ohio.

Where a range of rates for a particular foundry job is desired by an employer within which individual increases can be granted, under restrictions of Gen. Order No. 31, a range will be approved by the WLB that has as its midpoint the single sound and tested rate established for the job in that area. The range permitted will be 20c. per hr.



For shipyards, railroad car shops and other fabricators of heavy metal.

400 TON HYDRAULIC FORMING & FLANGING PRESS

A completely modern unit — fast, powerful and adaptable. Built to stand 24-hour production. Equipped with a unique type pump and valve design that eliminates the need for cooling coils with their inherent threat of water entering the oil supply line. If you fabricate heavy metal, investigate this and other of Beatty's complete line of punches, shears, coping machines, forcing presses, bulldozers, forming presses and related heavy machines.

HYDRAULIC HEAVY METAL WORKING EQUIPMENT

BEATTY MACHINE AND MFG. COMPANY
HAMMOND, INDIANA

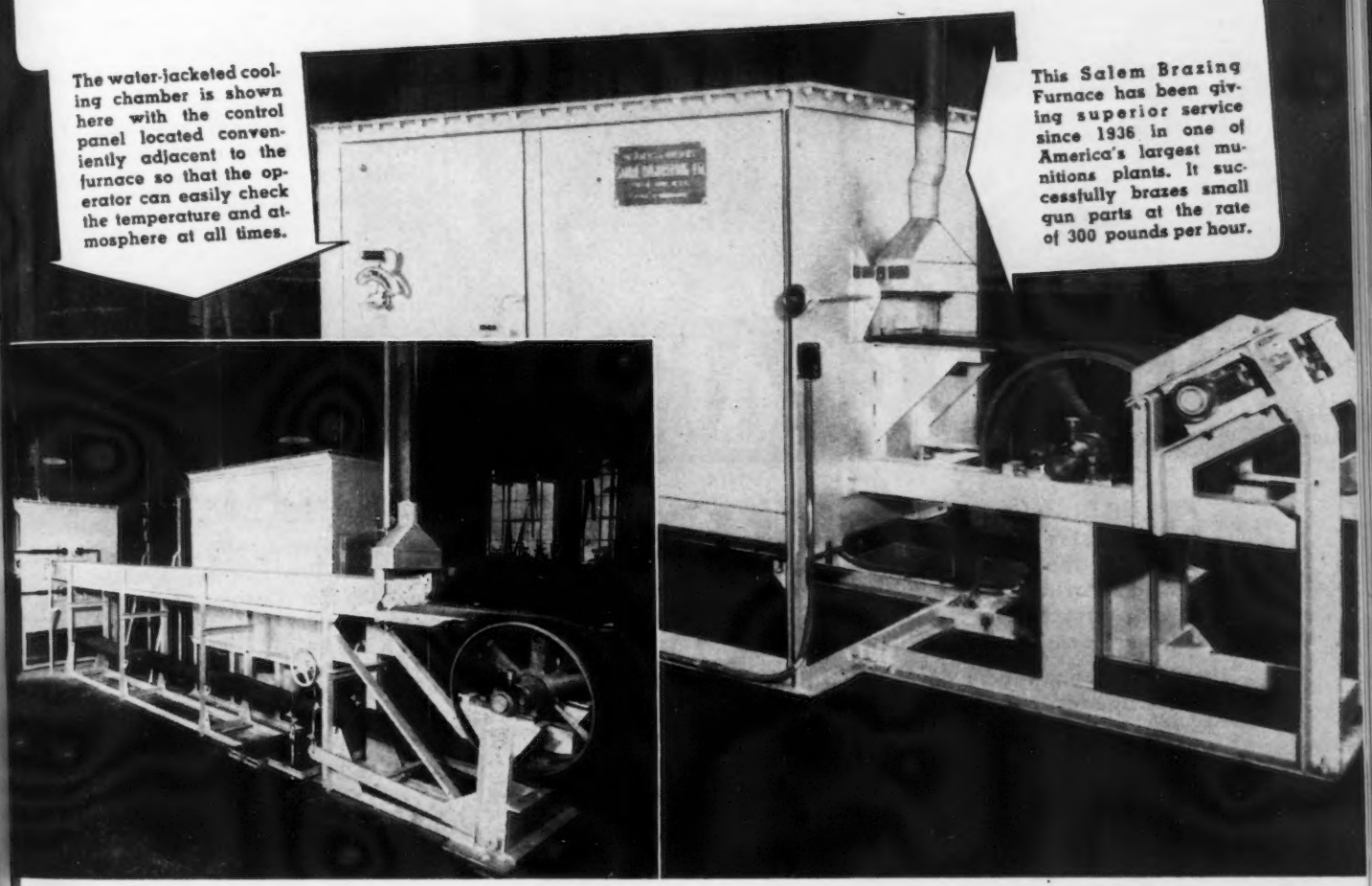
MILLIONTH VISITOR: Col. Gilbert I. Ross, chief of the New York Ordnance District, U. S. Army, points out the intricacies of a gun to Mlle. Eve Curie, millionth visitor to the exhibition of war weapons at the Chrysler Building, New York.

HIGH SPEED BRAZING OR SINTERING

This Type Furnace Does Both Accurately

The water-jacketed cooling chamber is shown here with the control panel located conveniently adjacent to the furnace so that the operator can easily check the temperature and atmosphere at all times.

This Salem Brazing Furnace has been giving superior service since 1936 in one of America's largest munitions plants. It successfully brazes small gun parts at the rate of 300 pounds per hour.



THROUGH accurate control of temperature and atmosphere, Salem Brazing Furnaces are readily adaptable to high-production sintering of parts made of powdered ferrous and non-ferrous metals. The type illustrated was designed for brazing small metal parts at accurately maintained temperatures up to 2100° F. The parts to be brazed or sintered travel on an endless alloy mesh conveyor through the furnace and water-jacketed cooling chamber. A special Salem SECO gas generator precisely controls the correct composition of atmosphere throughout the heating-cooling cycle with or without decarburization. Thus whether the parts are brazed or sintered, ferrous or non-ferrous, the proper atmosphere is produced to suit both the process and the product.

Salem Engineers will design special sintering furnaces, either electric or fuel fired, to speed your production. Their research, ingenuity, and years of experience in designing and building all types of heat treating furnaces will be applied to your individual needs. Consult Salem Engineering today on your sintering problems.

SALEM ENGINEERING COMPANY

SALEM ENGINEERING CO. · SALEM, OHIO

"DOWN TO THE SEA"

BUILDING that "Bridge of Ships to Berlin" to hasten the prompt, unconditional surrender of the Axis is America's biggest job today! Cooperating to the fullest extent in this nation-wide effort, are the shipyards of the Lancaster Iron Works at Perryville, Maryland.

It is here that a 60 ft. EUCLID CRANE operates continuously, occasionally 12 hours per day, lifting heavy boat sections . . . speeding Victory Ships "Down to the Sea".

In War as in Peace, EUCLID CRANES AND HOISTS play a major role in production speed-ups because of their inherent ability to render long, trouble-free service with minimum attention and upkeep cost.

That EUCLID CRANES AND HOISTS measure up to the exacting demands of increased wartime production is evident from the roster of prominent industrialists who rely upon them constantly. That they will continue to "deliver the goods" long after the Peace is Won is evident, too!

EUCLID CRANE *and* HOIST CO.
1361 CHARDON RD. • • EUCLID, OHIO

Proposed Gear Tolerances Being Reviewed By Industry

• • • **A tentative draft** of the proposed American Standard for Inspection and Tolerances of Gears, dated June, 1943, is being distributed to a selected list of individuals and organizations by the American Society of Mechanical Engineers before being finally approved and published. The proposed standard is sponsored by the A.S.M.E. and the American Gear Manufacturers Association and has been prepared under the procedure of the American Standards Association. This represents the third revision. The first draft was completed in 1929 and a revised proposal was issued in 1935. The present draft has received the approval of the A.G.M.A. committee.

The proposed standard, B6, consists of four sections, covering spur and helical gears, worms and worm gears, bevel and hypoid gears, and backlash in gears. When approved, the last section will supercede the American Recommended Practice for Backlash for General Purpose Spur Gearing which was approved by the A.S.A. in 1940.

Data Book Covering Metals And Alloys Newly Published

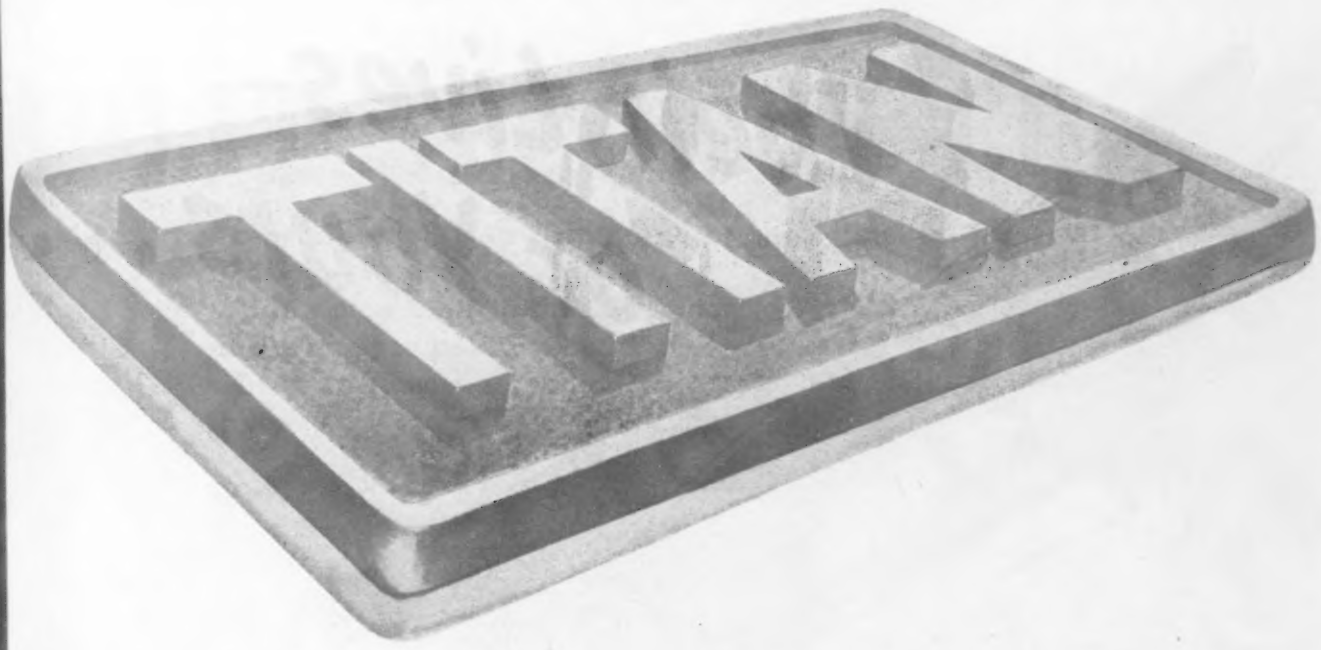
• • • **A useful** data book of 340 tables covering metals and alloys, authored by Samuel L. Hoyt of Battelle Memorial Institute, has been published by the book department of Reinhold Publishing Corp., New York.

The 324-page cross-section of the more important data on metals and alloys covers in many different units non-ferrous alloys, stainless steel, cast iron, wrought steel and others. Data for the heat treating steels are included.

A chart on hardness tests, a large table of conversion factors, standard grain sizes, an index of 1500 items, and specific data on resistance to corrosion are included. The price is $4.75.

Wrong Caption on Photo

• • • **The photo** on page 136 of the Aug. 5 issue carried the wrong caption. It showed Oliver W. Bonnafe, Lapointe Machine Tool Co., engineer, inspecting the 37-mm. broaching rifling machine which broaches seven barrels simultaneously. He won the National Metal Trades Association medal.



GREAT NAME IN BRONZE SINCE 1915

BRASS AND BRONZE RODS
FORGINGS, DIE CASTINGS
WELDING RODS

It takes more than buildings and equipment to build a business. The talent and experience of the Men of Titan have cast and forged a Great Name in Bronze.

Again today, as in World War I, the exacting requirements of war are proving the mettle of men as well as the metal they produce.

Qualitatively and quantitatively, the Men of Titan are multiplying their metallurgical skill by expanded production facilities. They are contributing to the striking power of the fighting equipment which depends on the rare properties of brass and bronze alloys for many vital parts.

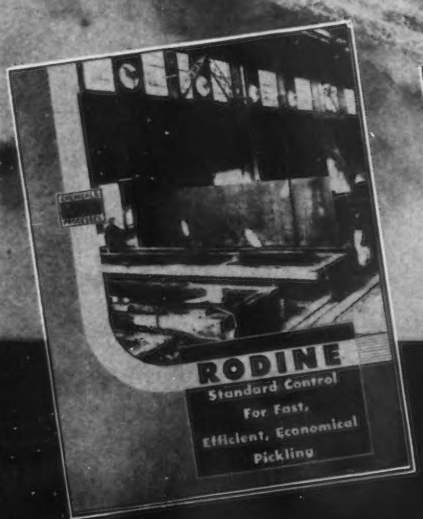
In looking ahead to Victory, the Men of Titan now offer post-war planners the experience and personal attention that helped build a Great Name in Bronze.

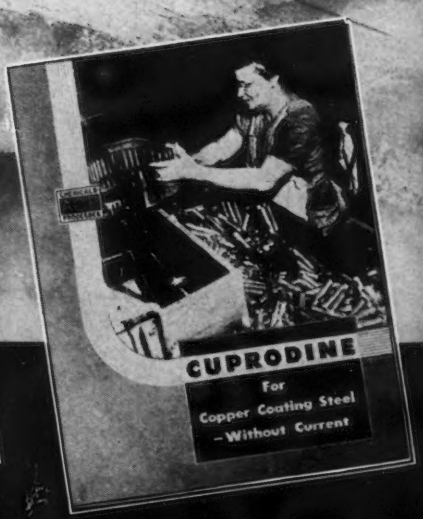
TITAN

METAL MANUFACTURING CO.
BELLEFONTE, PA.
A Great Name in Bronze Since 1915

Their Lives— or Yours . . .

CHEMICALS ACP PROCESSES





RODINE is a chemical pickle inhibitor effectively controlling the attack of pickling acid on steel without retarding removal of scale or rust. Rodine reduces noxious and corrosive fumes and improves pickling conditions. The Rodine controlled acid bath enables you to clean more metal in less time and eliminates spoilage from over pickling.

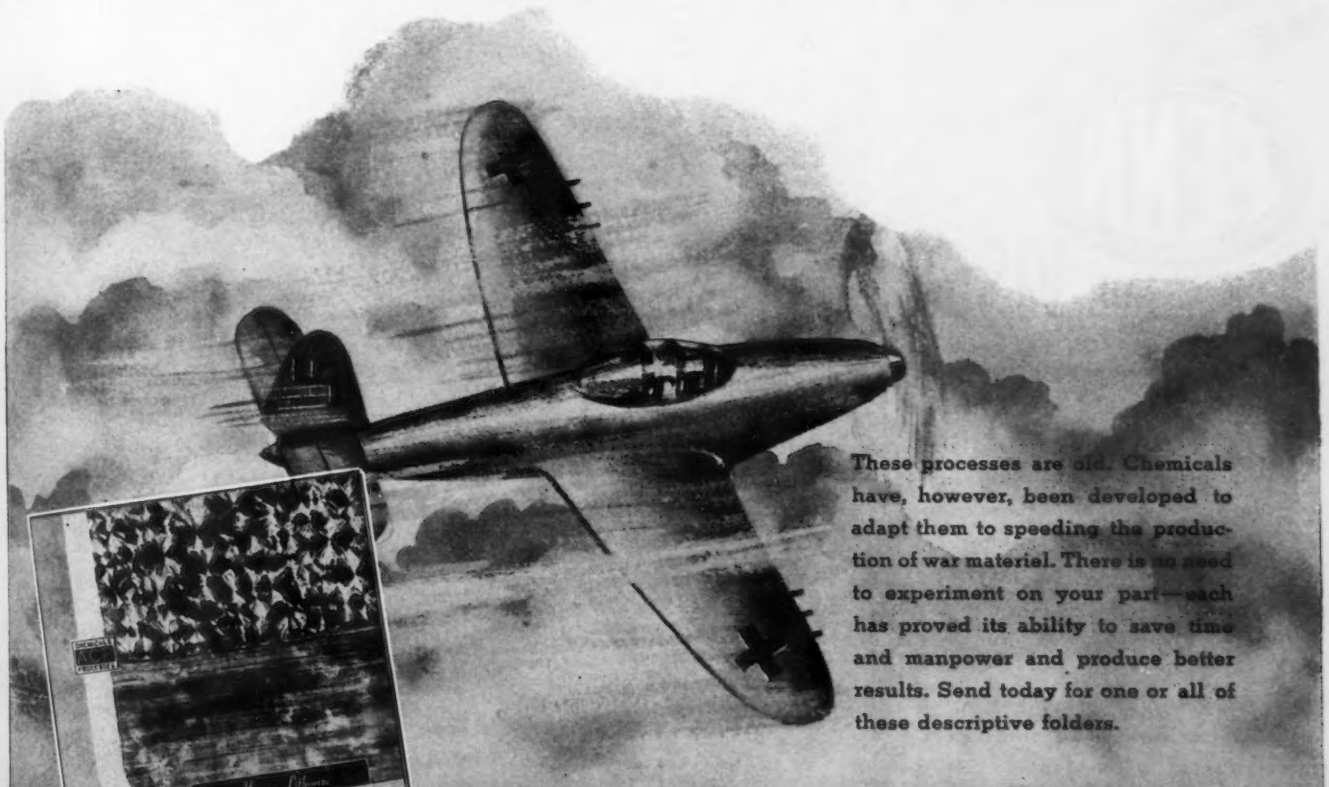
DEOXIDINE phosphoric acid type metal cleaner, removes light oil and annealing scale . . . also eradicates rust and rusters. Deoxidine is available for immersion process and for brush or spray application where indicated to expedite production. Deoxidine meets U. S. Ordnance Department requirements for its efficiency in removing rust and neutralizing rust producers before protective finishes are applied.

CUPRODINE has contributed materially in the production of shell cases from steel. The bright, adherent copper coating it produces on clean steel, by simple immersion, minimizes die wear, prevents metal pick up, reduces scratches and breakage in drawing operations. Cuprodizing steel, in metal fabrication, increases the life of dies from five to ten fold.

SPLIT SECONDS COUNT

Every metal part in plane, gun or shell must be flawless—lives are at stake.

From steel mill to finishing room ACP Chemical Products are helping to produce better finished parts, at greater speed, with fewer losses in spoilage and at a substantial saving in labor and materials.



These processes are old. Chemicals have, however, been developed to adapt them to speeding the production of war materiel. There is no need to experiment on your part—each has proved its ability to save time and manpower and produce better results. Send today for one or all of these descriptive folders.

Manufacturers of Inhibitors & Metal Working Chemicals

AMERICAN CHEMICAL PAINT CO.

AMBLER ACP PENNA.

LITHOFORM

produces a dense, adherent, stone-like coating of zinc phosphate on galvanized iron and other zinc or cadmium surfaces which forms a lasting bond between paint and metal. Lithoform is recognized by the U. S. Army and Navy as a proper method of preparing galvanized and zinc coated surfaces for paint.

AMERICAN CHEMICAL PAINT COMPANY, AMBLER, PA.

Please send me pamphlet on

Deoxidine ☐ Rodine ☐ Lithoform ☐ Cuprodine ☐

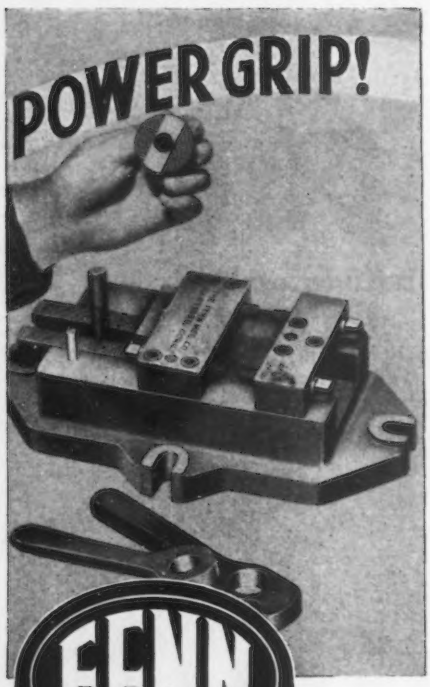
Name_____ Title_____

Company_____

Address_____

Note—West Coast Plants may address inquiries and orders for prompt delivery to Leon Finch, Ltd., 728 East 59th St., Los Angeles, Calif.

E-8



FENN

QUICK ACTION VISES

The Illustration Tells The Story

SERRATED surfaces both on sliding jaw and clamp bushing of the Fenn Vise give positive holding security. No possible chance of work slipping with this gripping feature. No shearing strain on clamp bolt either—only tensile strain for which it is amply heavy. Note the serrated surfaces. Note that they mesh perfectly — uniformly — yet can be instantly released for quick adjustment to other work. Note bolts for holding special jaws; quickly adapted for holding work without slipping, no matter what shape.

Used in these industries:

Airplane Engine Parts
Machine Gun Compensators
Machine Gun Parts
Automobile Parts
Refrigeration Parts
Electrical Equipment
Tool Making
Precision Instruments
Special Jobs and Accessories
And any small-parts production

Send for Bulletin No. 10

THE FENN MFG. CO.
HARTFORD, CONN.
ESTABLISHED 1900

Briefly Told—

New War Jobs, New Products Emphasize Industry's Fine Jo

• Producing authentic Eskimo type sleds for U. S. fighters in the Arctic is the war job of a Scranton, Pa., firm, Phenol Products. Three types are being made. All have spring steel runners and wooden frames.

•

• International Harvester Co. reports it has made voluntary price reductions of more than $16,000,000 on three contracts covering manufacture of a 20-mm. aircraft cannon at St. Paul, a 57-mm. gun carriage at Milwaukee and the Oerlikon anti-aircraft gun at Indianapolis.

•

• A new laminated phenolic sheet, reinforced with aluminum alloy strips, developed for aircraft flooring by the Glenn L. Martin Co., is reported to weigh 0.25 lb. per sq. ft. less than other flooring of equal strength. The saving in weight made possible by this new flooring is expected to represent, in a 50-ton flying boat, 423 lb. per plane.

•

• The Alien Property Custodian announced Aug. 9 that the General Electric Co. has assigned 37 patents covering cemented or sintered hard carbides, used in the making of machine tools, and that these are now available for use by American industry on a non-exclusive, royalty-free basis. General Electric originally acquired these patents from Fried Krupp Aktiengesellschaft of Germany.

•

• Ohio leads the nation in the field of industrial facility projects financed with public funds as a part of the war program, with a total of $1,158,129,000 worth of such projects according to figures just prepared by the WPB.

•

• The New York District OPA announced that a temporary order was obtained in Federal Court, Aug. 6, restraining A. John Bittson, A. John Bittson Engineering Co., and the World Distributors Corp., from violating OPA regulations. At the same time a claim for treble damages amounting to $58,500 was filed against Mr. Bittson and the two companies in which it was charged that they had violated steel price ceilings by $19,500.

•

• Hugh Fulton, counsel for the Truman Committee, said recently that production of boats by the Higgins Industries, Inc., New Orleans, is unequaled throughout the United States.

•

• President Roosevelt's expressed wish that the number of vessels to be turned over to Great Britain by the War Shipping Administration be increased to 20 per month is easily possible of accomplishment, according to J. F. Lincoln, president of Lincoln Electric Co. Mr. Lincoln bases his statement on the fact that advances in welding technique now in use will increase productivity of welding by 25 to 50 per cent. Translated in terms of number of ships built, this would mean a proportionate increase in the number of vessels which might be turned over to Great Britain.

•

• Peace talk has had a detrimental effect on production in the last several weeks, Lt. Comdr. Orman Freile, chief staff assistant of the Army and Navy Munitions Board, said to 200 Buffalo district war plant executives at a CMP clinic. He added that "the war is not in the bag and we can lose it if we waste our resources and fail to get necessary production to carry on the kind of offensive which lies ahead of us."

• General Electric Co. will produce mo than 11,000,000 horsepower of steam tu bine propulsion equipment this year fo U. S. Navy and Maritime Commissi ships of many types, according to E. Shreve, vice-president of the compa

•

• In the first six months of 1943, the Bal win Locomotive Works, Philadelphia, and wholly owned subsidiaries awarded sub-co tracts of approximately $65,000,000 on w orders, an increase of about 15 per cent ov 1942.

•

• A 6c. per hour wage increase, retroa tive to April 24, 1942, has been grant by the WLB to 1600 employees of th Armstrong Cork Co., Pittsburgh. Th agreement also included check-off o union dues from company payrolls. Wa increases have also been approved f workers of three other plants of Arm strong Cork, outside of Pennsylvania.

•

• A "share-load plan," to expedite less th carload freight movements, has been arrange through the Allegheny Region Traffic an Transportation Conference. When combinin lots, the railroad with the least amount o freight will turn its portion over to the ra road with the greater amount.

•

• At a special term of United Stat District Court in Pittsburgh on Sept. 1 30 miners accused of violating the Smith Connally law by instigating and aidi work stoppage will appear for tria Among them are presidents of fou United Mine Workers Union Locals. A panel of 100 jurors has already bee selected.

•

• Charles E. Wilson, WPB executiv vice-chairman, recently called for fu schedules of work in all war plants on Labor Day, Sept. 6, and asked labor an management to work together on thi day to top all previous records.

•

• Girl clerks used as tracers in the en gineering department of the Package Ma chinery Co., Springfield, Mass., are findin a new means for improvement through "visualization" classes being conducte for their benefit by company engineers.

•

• Employment of women in the productio departments of the Wickwire Spencer Ste Co. increased 78 per cent during the past year. E. C. Bowers, president, announced recently. A comparable increase was also reported in the office staffs.

•

• Chicago foundry men are going "back to school" at Illinois Institute of Tech nology. Ranging from a president of one of the companies to a sand-testing boy in another, 24 of them are taking a special course in cast iron metallurgy at Illinois Tech. The course was designed to relieve the shortage of metallurgists in the foundry in the Chicago area.

•

• In the first strike vote of its kind under the new Smith-Connally anti-strike bill, workers at two Allis-Chalmers Mfg. Co.'s plants, Chicago, voted 1005 to 336 in favor of striking. The ballots were cast in a secret election sponsored by NLRB. The dispute revolves around whether the United Farm Equipment and Metal Workers Union, CIO, or District 50 of the UMW should be the bargaining agent.

Green worker—but he's safe!

He's a new man in a vital war plant . . . working long hours . . . sometimes forgetting to be careful. Here is a real job for "A.W." Rolled Steel Floor Plate—to stop the alarming increase in slipping and falling accidents, to end floor troubles for good. "A.W." Floor Plate protects men essential in the war effort wherever they may be. Fire-proof, heat-proof, oil-proof, crack-proof. Write for folder.

Other products include Plates, Sheets, Billets, Blooms, Slabs—Carbon, Copper or Alloy analyses.

ALAN WOOD STEEL COMPANY

MAIN OFFICE AND MILLS: CONSHOHOCKEN, PENNSYLVANIA : SINCE 1826. District Offices and Representatives: Philadelphia, New York, Boston, Atlanta, Buffalo, Chicago, Cincinnati, Cleveland, Denver, Detroit, Houston, St. Paul, New Orleans, Pittsburgh, Roanoke, Sanford, N. C., St. Louis, Los Angeles, San Francisco, Seattle, Montreal.

DO YOU KNOW THE TRUTH about Hardness Testing?

● The new Clark catalog is more than a catalog.

It is a 20-page reference manual on the history, theory, practice, and equipment for modern, scientific hardness testing. Printed in two colors, size 8½" x 11", it is available without charge to manufacturing executives. Just drop a line on your letterhead to Department IA, CLARK INSTRUMENT, INC., 10200 Ford Road, Dearborn, Michigan.

CLARK
TOMORROW'S ACCURACY TODAY
HARDNESS TESTER

● More than 20 new post war products were exhibited recently in Des Plaines, Ill., by the Doall Co., an affiliate of Continental Machines, Inc. The display of the new and improved products was intended to instruct the company's representatives in the operating characteristics of the new items.

●

● The Donner Hanna Coke Corp., supplying all the coke needed by the local plants of Republic Steel Corp. and Hanna Furnace Co., has been designated by the Solid Fuels Administration as one of three by-product coke plants to share in a diversion of 56,000 tons of special purpose coal from other plants.

●

● A 27-year-old blind man has proved so successful at his job of inspecting precise optical and mechanical parts for rangefinders, heightfinders, and other fire control instruments that Bausch & Lomb Co., Buffalo, has hired three more to do the same type of work.

●

● The Washington Tin Plate Co. at Washington, Pa., will go out of business Sept. 1, according to the company. This plant was the last active company making hot rolled tin plate (THE IRON AGE, June 24, p. 94). The company had an annual capacity of 26,600 tons of hot dipped tin plate.

●

● The government's attempt to roll back prices of food and other necessities has failed, and, hence, organized labor is ready to demand that the "Little Steel" formula for wages be scrapped, Alan S. Haywood, CIO National Director of Organization, said recently at a union meeting in Pittsburgh.

●

● *One Milwaukee industrialist is reported to have remarked that it is much more difficult to win a renewal of a firm's Army-Navy "E" pennant than it is to obtain the original award. Excellent production is not the only thing involved; combating absenteeism and following WPB regulations are some of the other provisions.*

●

● Allis-Chalmers, Milwaukee, reported net income of $2,656,048.44, or $1.16 a common share for the second quarter, as against $1,432,137.82 for the first quarter, or 80½ cents a common share. Orders booked for the second quarter amounted to $157,130,043, compared with $59,748,074 for the first quarter. Unfilled orders as of June 30 were $281,148,014, compared with $183,705,029 on March 31.

●

● Recognizing the certainty that America's vast ship and aircraft production will bring great changes in international transportation after the war, the Chamber of Commerce of the United States will propose a basic national policy for conversion of this country's world-wide wartime transport networks permanent systems.

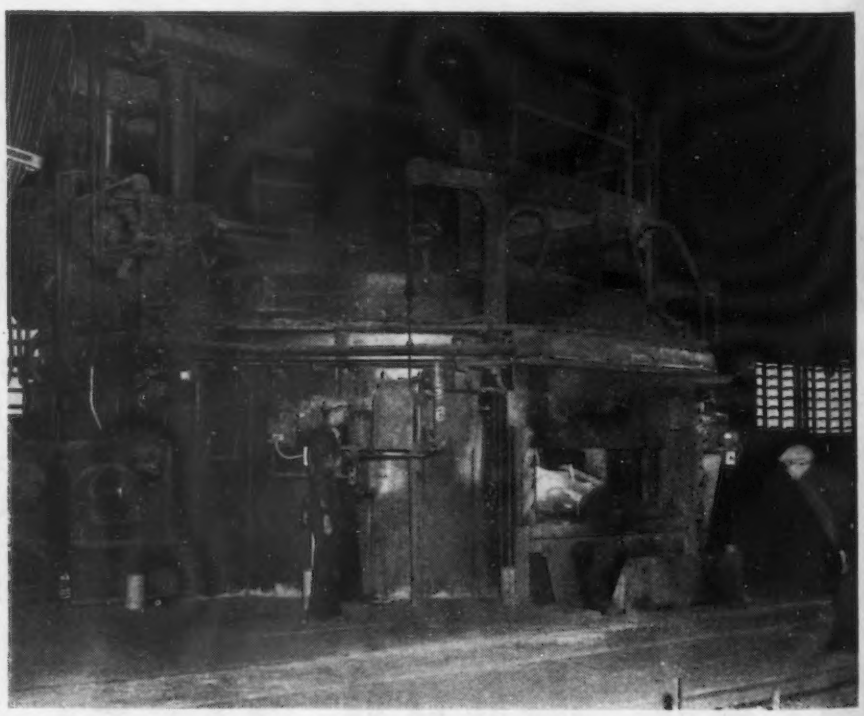
●

● *A total of 1910 plants and projects have been granted the Army-Navy "E" for excellence in production of war materials, it was announced Aug. 10 by Under Secretary of War Robert P. Patterson and Under Secretary of the Navy James Forrestal on the first anniversary of the presentation of the Army-Navy Production Awards. This is the first time since the joint award was inaugurated a year ago that the total number of awards has been made public. It is estimated that less than 2½ per cent of the eligible plants have received the award to date.*

●

● A new war department shipping document has had important results in simplifying shipments of war materials the War Department announced recently. The new document utilizes copies of one basic form for every billing, checking, tagging, inventory, and receiving operation in the entire movement of military supplies from depots in the interior of the United States to overseas ports.

NEW FURNACE: New 70-ton three-electrode electric unit put into operation recently at the South Chicago works of Carnegie-Illinois Steel Corp. The new furnace, built and installed by American Bridge Co., has an annual capacity of 65,000 tons and brings to six the number of electrics at the corporation's South Chicago plant.



THERE'S NO ESCAPING IT!

A rush order comes through from Washington —the production manager is needed at once!

He's a half a mile away from his desk... but you'll find him as fast as you can say his name... thanks to Stromberg-Carlson Straight-line Communication.

It does the job QUICKER and BETTER than by any other means!

Think of the savings in critical manpower. Think of how it makes your telephone system more effective... by not tying up limited lines.

It's the fastest way of giving instructions to prevent accidents... to help in emergencies. It's the most efficient way of broadcasting warning signals... fire alarms, air raid alerts, all clear.

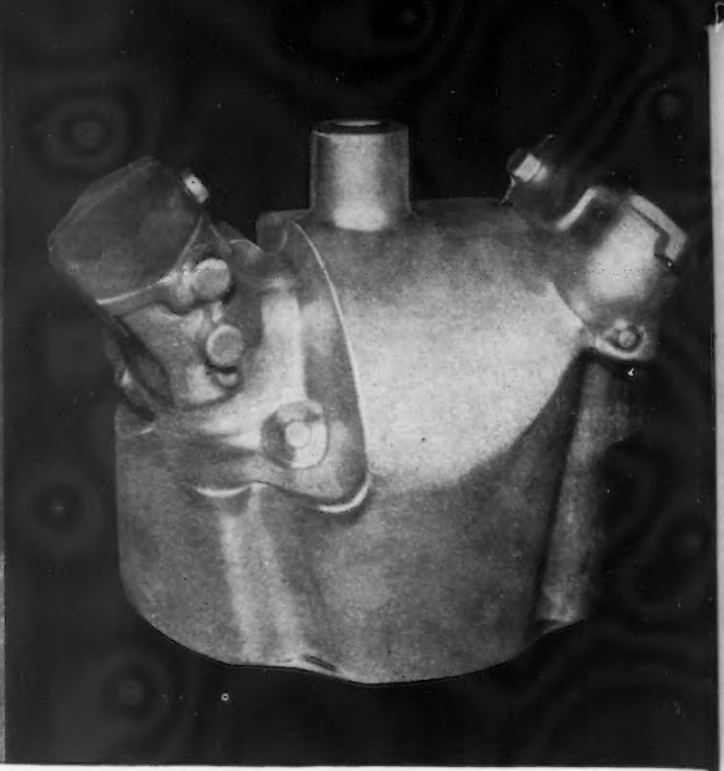
Think it over, and remember... Stromberg-Carlson has been manufacturing sound reproducing equipment of the highest reliability, the utmost durability for nearly half a century.

Today our installations are helping speed production, promote safety in war plants throughout the nation.

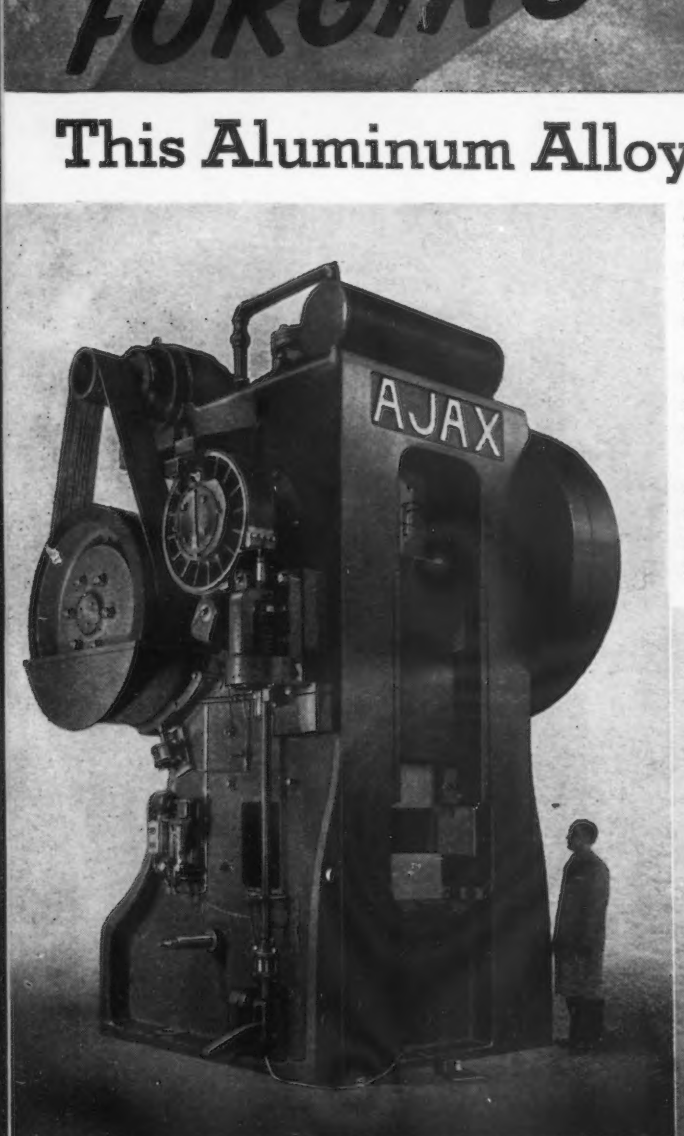
For these reasons, we believe we're specially fitted to solve your own communication problem. Before you decide on any particular sound system, get in touch with the Sound Systems Division of the Stromberg-Carlson Company, 100 Carlson Road, Rochester, New York. Write for free Booklet No. 1937.

STROMBERG-CARLSON, ROCHESTER, N. Y.

STRAIGHT-LINE COMMUNICATION SAVES MANPOWER • SPEEDS THE WORK TO VICTORY



This Aluminum Alloy Airplane Cylinder Head

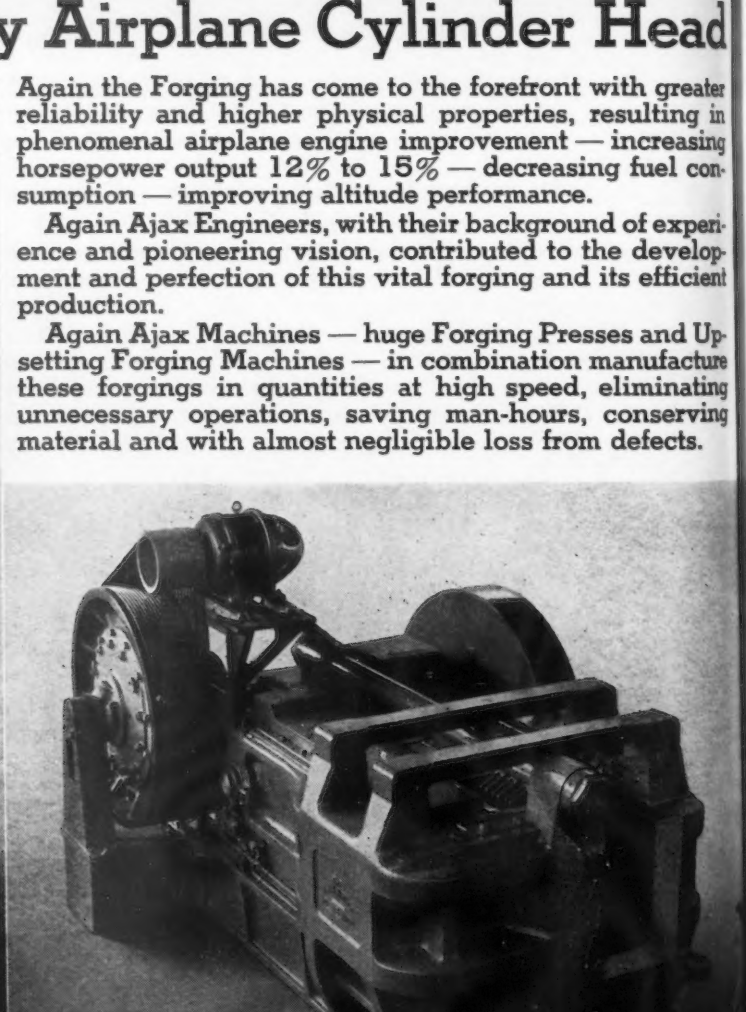


2500 ton Ajax High Speed Forging Press (Bulletin No. 75-S)

Again the Forging has come to the forefront with greater reliability and higher physical properties, resulting in phenomenal airplane engine improvement — increasing horsepower output 12% to 15% — decreasing fuel consumption — improving altitude performance.

Again Ajax Engineers, with their background of experience and pioneering vision, contributed to the development and perfection of this vital forging and its efficient production.

Again Ajax Machines — huge Forging Presses and Upsetting Forging Machines — in combination manufacture these forgings in quantities at high speed, eliminating unnecessary operations, saving man-hours, conserving material and with almost negligible loss from defects.



8" Ajax Forging Machine (Bulletin No. 65-B)

THE AJAX MANUFACTURING COMPANY
EUCLID BRANCH P. O. CLEVELAND, OHIO
621 MARQUETTE BUILDING • CHICAGO, ILLINOIS

Tour Leaves Arsenal To Form New Firm

• • • **Sam Tour,** who with Lieut. Col. L. S. Fletcher of the Ordnance Department, has developed and directed the research work at Frankford Arsenal Laboratory since September, 1940, and who has been director of the laboratory for the past two years, resigned from this position on Aug. 10 to devote his full time to the newly formed Sam Tour & Co., Inc.

Mr. Tour's work at the arsenal laboratory followed his appointment in June, 1940, to the Non-Ferrous Metallurgical Advisory Board of the Ordnance Department, from which he also resigned. He will be succeeded as director by Lieut. Col. C. H. Greenall, formerly of the Bell Telephone Laboratories, who since October has been the Officer in Charge, succeeding Lieut. Col. Fletcher, ordered to active duty. Major H. H. Stout, formerly of Phelps Dodge Copper Co., is administrative officer for research activities.

Mr. Tour served as metallurgist in the Ordnance Department during the first World War, and for a few years following was in charge of the Metallurgy Section of the Technical staff in the Office of Chief of Ordnance.

During his three years with the Frankford Arsenal laboratory, the staff has grown from 60 persons to 500 civilians and 6 officers, becoming the largest laboratory within the Ordnance Department.

A few of the many projects undertaken by the laboratory since the war include work on substitute solder, zinc base die casting, brass die casting, tough pitch copper for pressure cylinders, brass cartridge cases, steel cartridge cases for small arms and artillery, armor piercing, tracer and incendiary bullets, propellants, lubricants and solvents. In addition, research has been done on such subjects as season cracking of brass, the effects of low melting alloys on ignition, as a part of primer development work, corrosion and finishes, and methods of physical, chemical and spectrographic testing. Development and correction of non-ferrous metallurgical specifications are handled, under the general supervision of the arsenal.

Sam Tour & Co., formed July 1, to which Mr. Tour will now devote himself, has taken over the metallurgical laboratories he established during the 14 years he has been vice-president and chemical and metallurgical engineer of Lucius Pitkin, Inc.

The Pitkin company is continuing as analysts, assayers, chemists, consultants and shippers representative to the mining and metallurgical industries, while the Tour company has taken over the work as consultants, engineers, metallurgists, metallographers, radiographers, research developers and testers in the metallurgical, chemical and process engineering fields, with office at 65 Pine Street and laboratory at 45 Fulton Street, New York.

The new company, Mr. Tour reports, will develop projects from the beaker stage to full commercial production, including plant control over raw materials and supervision in processing or fabrication.

Modification Center Is Cleared of Waste Rumors

Birmingham

• • • **A thorough investigation** into the affairs of the Bechtel-McCone-Parsons Corporation airplane modification center here has been completed by the House Military Affairs Committee and no facts have been found "to substantiate rumors of fraud, graft or waste," Rep. John Sparkman, of Huntsville, Ala., a member of the committee, announced at Birmingham, Aug. 15.

Nowhere in the investigation did the committee or subcommittee find evidence of unusual waste, and facts found in the investigation did not warrant the sending of a committee or subcommittee to Birmingham, Mr. Sparkman said in part.

37,000 Women Now Steel Plant Workers

• • • About 37,000 women are working in steel plants today according to the American Iron and Steel Institute and in addition, approximately 27,700 more women are employed in the offices.

Women have been found capable of operating cranes, serving as helpers on rolling mills and in open hearth departments, inspecting steel products, running lathes, operating heating furnaces and chauffeuing tractors and trucks. In peacetime, only about 2500 girls were employed to inspect tin plate.

★

RUTHMAN

Gusher Coolant

PUMPS

★

Here is the best protector you can get for your cutting tools. It's a Ruthman Gusher Coolant Pump which supplies immediately all the coolant your tools require. Whether they need a trickle or a gusher stream, they get it at once.

And from the long-pull viewpoint, these pumps contain improved features which assure efficient performance for years with no clogging or other troubles. Use Ruthman Pumps and your coolant will always be on tap.

The RUTHMAN MACHINERY COMPANY
CINCINNATI • OHIO

BOTH VICTORS Are Winners

In your choice of hack saw blades VICTOR gives you two selections—both winners on the jobs they must tackle. For instance . . .

If your work calls for high speed sawing, select a VICTOR "Moly"*, the original molybdenum alloy blade. Its finish is gold in color. The name VICTOR is in black.

For difficult sawing jobs, your choice should be the VICTOR Unbreakable Special Flexible blade. This all-over black blade cuts like an all-hard. Its flexibility eliminates breakage and tooth strippage. Look for the word VICTOR in yellow.

For power sawing as well as hand operation, there are VICTOR Blades combining flexibility and long, useful life. Back these winners in your War for Victory.

Buy U. S. War Bonds

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**T. M. Reg.—Blades bearing the name "Moly" are made only by Victor Saw Works, Inc., and affiliated companies.*

VICTOR
SAW WORKS, INC.
MIDDLETOWN • NEW YORK
Manufacturers of Hack Saw Blades, Frames and Band Saws

4026

July Ingot Output Up 231,059 Tons from July, 1942

YEAR 1943

Production of Open Hearth, Bessemer and Electric Steel Ingots, and Steel for Castings. Source: American Iron & Steel Institute

Based on Reports by Companies which in 1942 made 98.3% of the Open Hearth, 100% of the Bessemer and 87.6% of the Electric Ingot and Steel for Castings Production

Period	Estimated production—all companies: Open Hearth Net tons*	Open Hearth Percent* of capacity	Bessemer Net tons*	Bessemer Percent* of capacity	Electric Net tons*	Electric Percent* of capacity	Total Net tons*	Total Percent* of capacity	Calculated* weekly production all companies (Net tons)	Number of weeks in month
January	6,576,589	97.8	478,058	85.9	369,395	95.4	7,424,042	96.8	1,675,856	4.43
February	6,033,674	99.3	447,843	89.1	344,532	98.6	6,826,049	98.5	1,706,512	4.00
March	6,785,295	100.9	503,673	90.5	381,219	98.5	7,670,187	100.0	1,731,419	4.43
1st Quarter	19,395,558	99.3	1,429,574	88.4	1,095,146	97.5	21,920,278	98.4	1,704,532	12.86
April	6,509,812	99.9	481,810	89.4	382,532	102.1	7,374,154	99.3	1,718,917	4.29
May	6,664,298	99.1	483,024	86.8	398,057	102.9	7,545,379	98.4	1,703,246	4.43
June	6,188,857	95.0	453,599	84.1	384,645	102.6	7,027,101	94.6	1,638,019	4.29
2nd Quarter	19,362,967	98.0	1,418,433	86.7	1,165,234	102.5	21,946,634	97.4	1,686,905	13.01
1st 6 months	38,758,525	98.7	2,848,007	87.6	2,260,380	100.0	43,866,912	97.9	1,695,667	25.87
July	6,516,387	97.1	466,288	83.9	393,342	101.9	7,376,017	96.4	1,668,782	4.42
August										4.43
September										4.28
3rd Quarter										13.13
9 months										39.00
October										4.43
November										4.29
December										4.42
4th Quarter										13.14
2nd 6 months										26.27
Total										52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,518,621 net tons open hearth, 125,681 net tons Bessemer and 87,360 net tons electric ingots and steel for castings, total 1,731,662 net tons; based on annual capacities as of January 1, 1943 as follows: Open hearth 79,180,880 net tons, Bessemer 6,553,000 net tons, electric 4,554,980 net tons.

* Revised January through February, 1943.

YEAR 1942

Production of Open Hearth, Bessemer and Electric Steel Ingots, and Steel for Castings. Source: American Iron & Steel Institute

Based on Reports by Companies which in 1942 made 98.3% of the Open Hearth, 100% of the Bessemer and 87.6% of the Electric Ingot and Steel for Castings Production

Period	Estimated production—all companies: Open Hearth Net tons*	Open Hearth Percent* of capacity	Bessemer Net tons*	Bessemer Percent* of capacity	Electric Net tons*	Electric Percent* of capacity	Total Net tons*	Total Percent* of capacity	Calculated* weekly production all companies (Net tons)	Number of weeks in month
January	6,322,215	95.3	490,874	86.0	299,017	94.2	7,112,106	94.5	1,605,442	4.43
February	5,785,918	96.6	453,549	88.0	273,068	95.2	6,512,535	95.9	1,628,134	4.00
March	6,572,930	99.0	493,191	86.4	325,990	102.7	7,392,111	98.2	1,668,648	4.43
1st Quarter	18,681,063	97.0	1,437,614	86.7	898,075	97.4	21,016,752	96.2	1,634,273	12.86
April	6,345,133	98.7	454,834	82.2	321,324	104.5	7,121,291	97.7	1,659,975	4.29
May	6,595,440	99.4	453,938	79.5	333,200	104.9	7,382,578	98.1	1,666,496	4.43
June	6,239,674	97.1	452,528	81.8	323,100	105.1	7,015,302	96.3	1,635,269	4.29
2nd Quarter	19,180,247	98.4	1,361,300	81.2	977,624	104.8	21,519,171	97.4	1,654,049	13.01
1st 6 months	37,861,310	97.7	2,798,914	83.9	1,875,699	101.1	42,535,923	96.8	1,644,218	25.87
July	6,345,315	95.7	453,686	79.6	345,957	96.6	7,144,958	94.5	1,616,506	4.42
August	6,414,637	96.5	467,293	81.8	345,725	96.3	7,227,655	95.4	1,631,525	4.43
September	6,286,855	97.9	437,961	79.4	332,703	95.9	7,057,519	96.4	1,648,953	4.28
3rd Quarter	19,046,807	96.7	1,358,940	80.3	1,024,385	96.3	21,430,132	95.4	1,632,150	13.13
9 months	56,908,117	97.3	4,157,854	82.7	2,900,084	99.4	63,966,055	96.3	1,640.155	39.00
October	6,750,829	101.5	461,897	80.9	366,788	102.2	7,579,514	100.0	1,710,951	4.43
November	6,371,750	99.0	458,469	82.9	349,593	100.5	7,179,812	97.8	1,673,616	4.29
December	6,471,261	97.6	475,204	83.4	358,075	100.0	7,304,540	96.6	1,652,611	4.42
4th Quarter	19,593,840	99.4	1,395,570	82.4	1,074,456	100.9	22,063,866	98.2	1,679,137	13.14
2nd 6 months	38,640,647	98.0	2,754,510	81.3	2,098,841	98.6	43,493,998	96.8	1,655,653	26.27
Total	76,501,957	97.9	5,553,424	82.6	3,974,540	99.8	86,029,921	96.8	1,649,979	52.14

Note—The percentages of capacity operated in the first 6 months are calculated on weekly capacities of 1,498,022 net tons open hearth, 128,911 net tons Bessemer and 71,682 net tons electric ingots and steel for castings, total 1,698,622 net tons; based on annual capacities as of Jan. 1, 1942, as follows: Open hearth 78,107,260 net tons, Bessemer 6,721,400 net tons, electric 3,737,510 net tons. Beginning July 1, 1942, the percentages of capacity operated are calculated on weekly capacities of 1,500,714 net tons open hearth, 128,911 net tons Bessemer and 81,049 net tons electric ingots and steel for castings, total 1,710,674 net tons; based on annual capacities as follows: Open hearth 78,247,230 net tons, Bessemer 6,721,400 net tons, Electric 4,225,890 net tons.

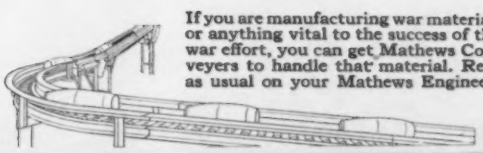
* Revised January through December, 1942.

TICKETED FOR *Tokio*

TOJO'S Day of Reckoning is coming and Mathews Engineers are cooperating with Plant Engineers to speed that day.

Night and day, Mathews Conveyers are moving an endless procession of armor plate, strip steel, bombs, shells, cartridge cases, and vital plane and ship parts, all material destined to make it warm in Tokio.

If your production depends on the precision movement of materials, a Mathews Conveyer System is a probable means of speeding operations all along the line. Your Mathews Engineer will gladly consult with you toward the solution of any conveying problem.



If you are manufacturing war material, or anything vital to the success of the war effort, you can get Mathews Conveyers to handle that material. Rely as usual on your Mathews Engineer.

MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION

MATHEWS CONVEYER COMPANY ELLWOOD CITY PENNSYLVANIA

PERSONALS

• **Charles L. Beard** has been elected a vice-president of Bell Aircraft Corp., Buffalo. He will hold this office in addition to that of secretary of the company. Succeeding Mr. Beard as treasurer is **Louis Fenn Sperry**, formerly treasurer of the Panhandle Eastern Pipeline Co.

• **James J. Nelson** has been made general manager of the Cramp Brass & Iron Foundries Division, the Baldwin Locomotive Works, Philadelphia. Mr. Nelson joined Cramp Brass & Iron Foundries Co. in 1932 as vice-president and sales manager, and when the company became affiliated with the Baldwin group, he continued as sales manager of the Cramp division.

• **Walter G. Hoffman** has been made president of the Electro Alloys Co., Elyria, Ohio, newly acquired subsidiary of the American Brake Shoe Co. Mr. Hoffman was formerly manager of the alloy department, manganese steel division, American Brake Shoe Co.

• **Russell B. Barnett** has been appointed vice-president in charge of company sales of the Peter A. Frasse & Co., Inc., New York. Mr. Barnett was formerly Philadelphia district manager. **John D. Drummond** who has been with the company for 25 years will succeed Mr. Barnett as Philadelphia manager. **Val Hansel** has been made New York sales manager. He has been with the New York sales department for 16 years, and was made assistant manager of sales in 1937.

CHARLES L. BEARD, vice-president of Bell Aircraft Corp., Buffalo.

• **Frank Shugert** has been appointed director of industrial relations, Elastic Stop Nut Corp. of America, Elizabeth, N. J. He was formerly industrial relations director for the Ranger Aircraft Engine division, Fairchild Aircraft Co.

• **Walter H. Maynard**, formerly assistant to the purchasing agent in charge of iron and steel scrap of the American Rolling Mill Co., Middletown, Ohio, has resigned to join the Middletown Iron & Steel Co.

• **D. H. Barr** has been appointed assistant to the general superintendent of the Johnstown-Lorain Works, Carnegie-Illinois Steel Corp.

• **Arthur M. Penhallow** has been appointed controller of the Osborn Mfg. Co. Prior to his appointment at Osborn, Mr. Penhallow was vice-president of the Graber Mfg. Co., Cleveland.

• **Carl C. Coon** has been appointed wiring materials field representative in Virginia and North Carolina for the General Electric Co. He will succeed **J. M. Murphy** who recently joined the Navy.

• **Earl K. Clark** has been made manager of the appliance engineering department, Westinghouse Electric & Mfg. Co., Pittsburgh. Mr. Clark succeeds W. J. Russell who resigned recently. **H. R. Cummins** is the new assistant manager of the same department.

• **Tracy Langdon**, vice-pesident of the D. A. Stuart Oil Co., Chicago, has resigned to accept an executive position with the American Oil & Supply Co., Newark, N. J.

• **Lester D. Chirgwin** has been recently elected a member of the board of directors of the Farrel-Birmingham Co., Inc., Ansonia, Conn. Mr. Chirgwin started with the company in 1909

JAMES J. NELSON, general manager of the Cramp Brass & Iron Foundries Division, Baldwin Locomotive Works, Philadelphia.

WALTER G. HOFFMAN, president of Electro Alloys Co., subsidiary of American Brake Shoe Co.

Photo by Dubois—The Drake

RUSSELL B. BARNETT, vice-president in charge of company sales, Peter A. Frasse & Co., Inc., New York.

Photograph by Bachrach

as an office boy. He has successively held the positions of draftsman, production manager, and general manager.

• **John Easton** has been appointed Director of the development and standardization activities of the Whiting Corp., Harvey, Ill., succeeding **A. J. Brown** who has been transferred to California to be manager of the Pacific Coast branch.

• **Anthony G. Allison** has been made director of public relations of the Transportation Association of America.

• **Fred W. Fraley** has been appointed vice-president and director of sales of the Diamond Alkali Co., Pittsburgh. Mr. Fraley has been with the company for 15 years.

• **William B. Hurley** has resigned from the Detroit Ordnance District and has taken up his former duties with the Detroit Edison Co.

• **A. E. Armstrong,** president of Wells Mfg. Co., Three Rivers, Mich., has become general manager of the company. **R. W. Bowers,** formerly of Armstrong Machine Works, Inc., has been appointed assistant general manager. **F. Robert Jubb** has been made secretary and treasurer. **Orin R. Ash,** vice-president, and **C. E. Millard,** secretary, have both resigned recently.

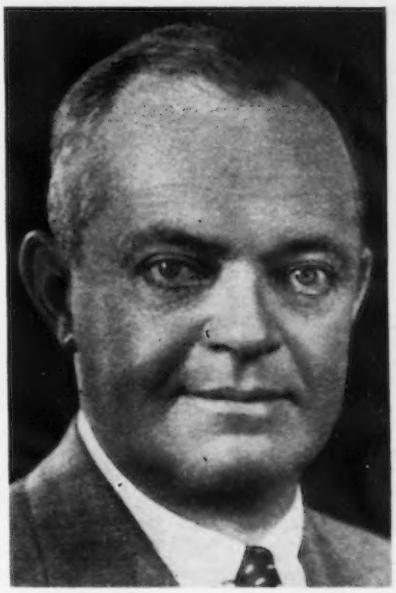
• **C. A. Schroeder,** formerly manager of the Wisconsin-Minnesota district of the Globe Steel Tubes Co., Milwaukee, has been made manager of the Cleveland district.

• **W. J. Buttfield,** president of Vulcan Detinning Co., Sewaren, N. J., has been elected a member of the board of directors of the Continental Can Co., Inc., New York.

• **W. B. Gillen** has been named manager of manufacturing of the tube division of the Electronics Department, General Electric Co. He was formerly manager of the Lamp Works, East Cleveland.

• **Luther L. Sheppard** has been made resident manager of the card-manufacturing plant at San Jose, Cal., of International Business Machines Corp. He was formerly manager of the Indianapolis office. **Roger R. Williams** has been made superintendent of the San Jose plant.

• **R. M. Burk** has been appointed manager of sales for the Spang-Chalfant Division, National Supply Co., Pittsburgh. Mr. Burk joined National Supply Co., in 1926, in succession became manager of sales in Los Angeles and St. Lonis for Spang-Chalfant. In 1940 was appointed assistant to the vice-president of National Supply Co.



R. M. BURK, manager of sales for the Spang-Chalfant Division, National Supply Co., Pittsburgh.

• **Charles E. Stemmle** has been made personnel director for the Ohio Crankshaft Co., and Ohio Crankshaft, Inc., Cleveland. Mr. Stemmle, formerly assistant personnel manager, takes the place vacated by **Robert R. Hamilton** who recently resigned.

• **Ray F. Ellis** has been appointed assistant general sales manager of E. C. Atkins Co., Indianapolis. Mr. Ellis has been with the company since 1914, and was formerly assistant industrial sales manager.

• **F. W. Wildman** has been named assistant to the president of Chicago & Southern Air Lines. Mr. Wildman was formerly with Dun & Bradstreet, Inc., where he was manager of their special investigation and analysis division for the Memphis district. **Clinton M. Hester** has been named Washington Counsel for the company. Mr. Hester has spent over 20 years in various departments of the Federal Government and was the first Administrator of the Civil Aeronautics Authority.

• **Fred E. Harrell,** assistant chief engineer of the Reliance Electric & Engineering Co., Cleveland, has been appointed chief engineer of the company. Mr. Harrell joined the sales engineering department of Reliance in 1924. In 1927 he was put in charge of the drafting room, and in 1934 was made assistant chief engineer.

• **Adolph G. Schroeder,** has been appointed manager of the machinery department of Iron & Steel Products, Inc., Chicago. He succeeds **A. E. Waleski,** who has resigned.

• **Walter J. Murphy,** editor of "Industrial and Engineering Chemistry," and "Chemical and Engineering News," publications of the American Chemical Society, has been appointed a member of the division of chemistry and chemical technology, National Research Council.

• **John P. Mullen** has been appointed to the newly-created post of educational director of the Gray Iron Founders' Society, Cleveland. Mr. Mullen was publicity director of the Chicago Mercantile Exchange for the past seven years.

OBITUARY...

• **Charles H. Wilkinson,** president of Logansport Machine, Inc., partner and general manager of the Cotner-Wilkinson Co., both of Logansport, Ind., and president of the North American Diamond Corp., Murfreesboro, Ark., died suddenly July 13. Mr. Wilkinson was 59 years of age.

• **Henry J. Mollenberg,** president of the Mollenberg-Betz Machine Co., Buffalo, died July 11. He was 75 years of age.

• **Alonzo T. Munzert,** weighmaster at Bethlehem Steel Co. for sixteen years, died July 14.

• **Walter L. Rous,** cashier and bookkeeper for the Tonawanda Iron Corp., Tonawanda, N. Y., died August 2. Mr. Rous had been with the company for 53 years. He was 85 years of age.

• **Allan Seymour,** Philadelphia district manager for the abrasive division, Norton Co., Worcester, Mass., died July 30. He had been with Norton Company for 25 years.

• **Samuel J. Eberwein,** aged 47, assistant superintendent of the Electric Furnace Co., Salem, Ohio, for the past 20 years, died July 21.

• **William S. Shields,** secretary and treasurer of the Hardie-Tynes Mfg. Co., Birmingham, died recently. He had been associated with Hardie-Tynes since the early 1890's. He was 77 years of age.

MACHINE TOOLS

. . . News and Market Activities

Machine Tool Dealers Face Dark Future

Cleveland

• • • **"The honeymoon is over** and the bride is home washing the Sunday dinner dishes," said the president of a large machine tool dealer organization this week when asked about new business. Now, to the dealer especially, comes the difficult job of keeping in business. Dealer sales at present are all restricted to finishing up tooling and rounding out production equipment. All large tool orders have already been shipped or will be shortly, and with no new construction or building projects in the offing, dealer sales will continue to slump.

According to reports of both dealers and builders, there is a growing tendency toward restriction of such contracts that are already under construction, with frequent cancellations of parts of the machine tool orders for the jobs. This condition only accentuates the fast drying up pool of new machine tool orders.

Dealers in the area report that sales today are not only spotty, but are for small tools and tooling items. These orders cover such items as dust collectors, lapping machines, grinder stands and other small units. On the tooling side, special box tools, tapping tools, collets and similar items are moving with deliveries ranging from 10 days to two weeks.

The big question in the minds of machine tool dealers is: "What to do now." Indications are that many dealers will concentrate sales activities on just the small tool items and tooling. Efforts will be made to modify and better existing tooling set-ups in war plants, where heretofore such tools as could be obtained were quickly grabbed up. This will have the possible effect of helping wring the last extra ounce of production out of a plant, and will keep dealers on the job.

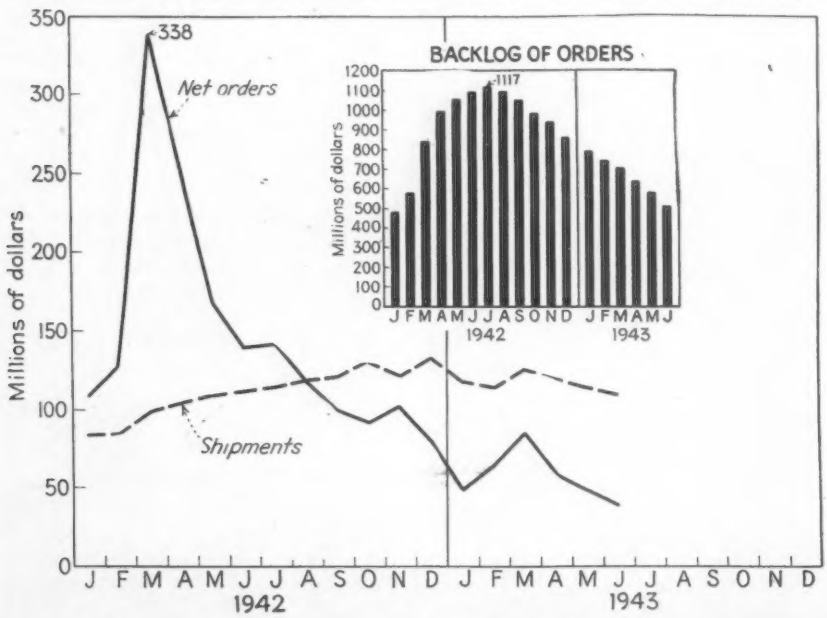
Those dealers that have a diversified line of products, not restricted to machine tool lines alone, have a much better chance. There is still a strong demand for miscellaneous combustion equipment, heat treating equipment, metal cleaning machinery and other such items. The dealers that handle these items may find that the bulk of their 1943 annual business has shifted from machine tools to such lines.

Other dealers, however, that carry only machine tools are groping in the dark. The only solution to date is in having the sales forces take off their coats, roll up shirt sleeves, and start out on a tough job of peddling. It will be hard and some dealers may fall by the wayside, but there is nothing else to be done. The machine tool builders, many of which are now on subcontract work, will stay busy until the war is over, but the dealer, an important link between supply and demand, faces some pretty hard weeks and months ahead.

•

Machine Tool Shipments and Orders

● June machine tool shipments were $108,689,000, off 5 per cent from the May volume of $113,710,000. Net orders (new orders less cancellations) dropped 21 per cent from May to June, $48,091,000 down to $38,322,000. The cumulative backlog at the end of June stood at $511,478,000. This compares with an alltime peak of $1,117,391,000 worth of undelivered orders on the books in July, 1942. Source of data: War Production Board.



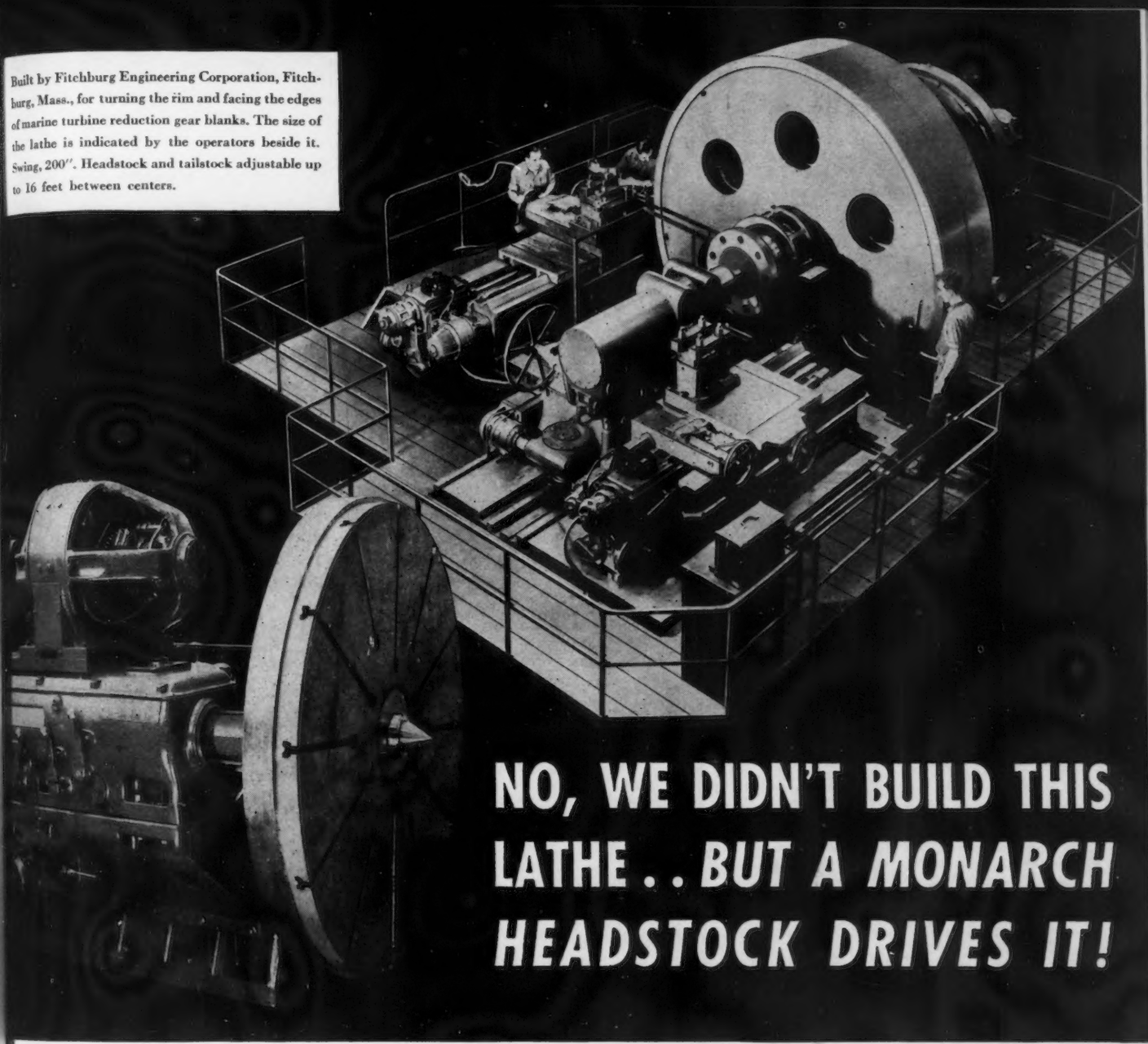
Conversion Being Accelerated

Cincinnati

• • • **Conversion to other** than machine tool items is being accelerated in local machine tool plants, although only a few plants have actually begun the conversion. Public announcement was made last week by the LeBlond Machine Tool Co. of its beginning the manufacture of large pumps, but so far, public announcement has not been made by any other machine tool manufacturer in this district. All, however, indicate their interest in such other items, and several have stated they are now definitely manufacturing other items than machine tools, but because of the government requirements are not revealing the exact items.

While production in all the plants is still being held to a very high level, the labor situation has definitely eased. Most personnel departments would be very happy, of course, to have good experienced mechanics, but they are not accepting anybody that applies as has been almost the custom heretofore. Replacement of departing employees is being held at a minimum and in many instances the present factory forces are down considerably from the level of the first of the year.

Further advance of unionization was noted in the election of CIO as the bargaining agent in the plant of the Lodge & Shipley Machine Tool Co. Active campaigning has been going on in local plants for some months past, but no additional elections have been so far scheduled.



Built by Fitchburg Engineering Corporation, Fitchburg, Mass., for turning the rim and facing the edges of marine turbine reduction gear blanks. The size of the lathe is indicated by the operators beside it. Swing, 200". Headstock and tailstock adjustable up to 16 feet between centers.

NO, WE DIDN'T BUILD THIS LATHE . . . *BUT A MONARCH HEADSTOCK DRIVES IT!*

Selection of Monarch headstock for this Fitchburg lathe is evidence of the power and dependability of the Monarch mechanism. Its "huskiness" and rigidity amply qualify it for this work, and the 30 hp motor provides plenty of driving power.

Few manufacturers require equipment of this type. However, every user of lathes must be sure that his equipment has the stability, the toughness, the rigidity and the power, combined with unfailing accuracy in performance, to carry out the requirements of his work.

The selection of Monarch lathes, for a wide variety of work in war production, was based upon their proved productivity in peacetime. These same qualities are being maintained and amplified, today.

Manufacturers planning their peacetime operations are invited to consult with Monarch engineers on their lathe requirements.

MONARCH LATHES
Save Time

THE MONARCH MACHINE TOOL COMPANY · SIDNEY · OHIO

NON-FERROUS METALS

. . . News and Market Activities

Italian Non-Ferrous Works Listed

• • • **The non-ferrous metal** industries of Italy, which may soon become available to the United Nations, are mainly concentrated in the north, although there are important properties in southern Sardinia, Central Italy and an isolated zinc smelter in the southern toe, according to the London *Metal Bulletin*, which recently tabulated Italy's metallurgical plants. It was pointed out that in particular the loss of Sardinia would deprive Italy of valuable supplies of lead, zinc and magnesium. No attempt was made by the *Bulletin* to survey the non-ferrous metal fabricating industries, many of which are concentrated at Milan, Turin and Genoa. The list of metallurgical plants which follows is probably incomplete, omitting possible new works and extensions of old ones.

North

Aosta—Magnesium works of Società Nazionale Cogne.
Bolzano—Aluminium plant of Industria Nazionale Alluminio. Magnesium works of Soc. Italiana per il Magnesio e le Leghe di Magnesio.
Borgofranco—Aluminium refinery of Soc. Alluminio Italiano.
Ferrara—Projected aluminium works of the Italian Edison group.
Idria—Quicksilver producing center.
Mantua—Another projected aluminium works of the Italian Edison group.
Mori—Aluminium works of Società Nazionale dell' Allumino (Montecatini group).
Porto Marghera, near Venice—Alumina plants of Soc. Ital. Allumina (Montecatini group). Alumina plant of Industria Nazionale Alluminio (same group). Alumina and aluminium plants of Soc. Alluminio Veneto Anonima. Electrolytic zinc works of Società Italiana del Piombo e dello Zinco (Montecatini group).
Rivarolo, near Genoa—Vanadium recovery plant. According to advices some time ago another plant was projected at Serra Ricco, also near Genoa.
San Dalmazzo di Tenda—Electrolytic zinc smelter of Cia. Impresa Elettriche Liguri: this was, however, idle before the war and no recent news has come through regarding its condition.
Spezia—Lead smelter of Soc. Min. e Met. di Pertusola.
Vado—Zinc smelter of Società di Monteponi.

Centre

Appuania, near Rome—Magnesium plant to produce metal from sea water (Montecatini group).
Appulia, near Rome—Magnesium plant.
Bussi—Alumina plant of Soc. Alluminio Veneto Anonima.
Leghorn—Copper smelter of Società Metallurgica Italiana.
Monte Amiata and S. Fiora—Quicksilver properties.

South

Cotrone—Electrolytic zinc works of Soc. Min. e Met. di Pertusola.

Island of Sardinia

Monteponi—Electrolytic zinc smelter of Società di Monteponi.
San Gavino—Lead smelter (Montecatini group).
Suergiu—Magnesium plant in southwest of island formerly owned by S.A. Magnesio Italian Sulcis, but purchased by Società Nazionale Cogne jointly with a German group.
Su Suergiu—Antimony mines and smelter in south-east of island operated by S.A. Miniere e Fonderie di Antimonio.

•

Canadian Metal Output

• • • **Canadian production** figures for refined copper, lead, nickel and zinc for 1942 have been issued, the first such figures released since early in the war. The 1943 figures for the four metals will indicate an increase of 25 per cent, in aggregate, over those of 1939, it is reported.

Figures for 1942 and 1939 are:

	1942	*1939*
Refined copper	270,600	232,000
Refined lead	243,800	191,000
Refined nickel	93,300	64,500
Refined zinc	216,000	175,600

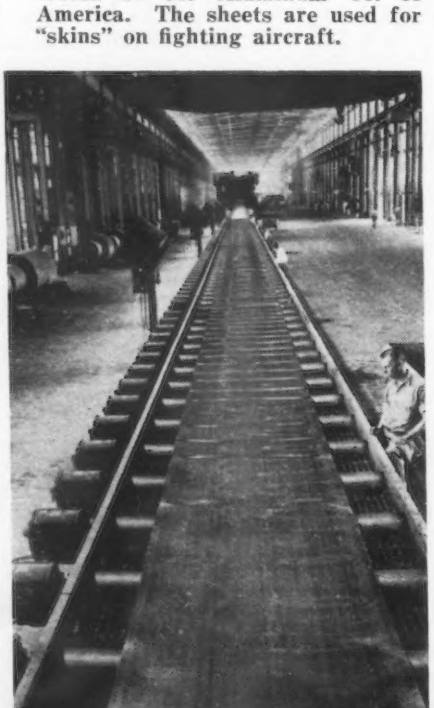
•

Tin—Nigeria and Bolivia

• • • **Tin production** is reported up, though figures are not disclosed, in a report made by the chairman of Ex-Lands, Nigeria, Ltd., recently in London. Though this company is not one of the large producers, its experience is believed to parallel that of other mines in Nigeria. An indication of the increased output was given by the chairman's announcement that shareholders will enjoy an increase in total dividend distribution from 20 to 25 per cent.

In the meantime, the Texas City smelter is reported still considerably below contemplated capacity, due to the problems presented by low grade Bolivian ore. Not only does the smelting of the ore itself present problems, but it is also below quota quantities.

AIRCRAFT "SKINS": Shown here is more than a city block of aluminum strip being processed at the Chicago Works of the Aluminum Co. of America. The sheets are used for "skins" on fighting aircraft.



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Cadmium Insufficient

• • • **The maximum quantity** of cadmium which can be made available for aircraft use during the third quarter will be only 75 per cent of estimated requirements, according to a recent survey by the WPB. Consumers' stocks have been drastically reduced and the government stockpile is reported equivalent to only one month's supply.

Conservation will be attempted first through cooperation of all contractors in screening out non-essential uses and in substitution. If this is not sufficiently effective, the WPB will be forced to make a general percentage cut on all allocations, however essential.

• • • **Brief Notes:** OPA has increased maximum prices for silver scrap to the seller's March, 1942 price, plus 35.125c. per fine troy oz. of contained silver, in the case of scrap sold as Treasury or domestic silver casting metal; previously an addition of 9.634c. represented the maximum, with all scrap priced as foreign silver . . . Smelters of aluminum scrap report themselves unable to accept further heavy shipments of scrap, with their facilities already glutted . . . Of the 4500 soldiers recently released by the War Department for work in the non-ferrous metal mines, only about 50 per cent elected to return to the mines. Representatives of mining companies have reported that in many cases those who did return have hurt the morale of other mines by expressing dissatisfaction at leaving the army for the mines.

Refiner, Smelter Quotations

(Cents per lb.)

Copper, electrolytic, Conn. Valley	12.00
Copper, electrolytic, New York	11.75
Copper, Lake	12.00
Tin, Straits, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.67
Lead, St. Louis	6.35
Lead, New York	6.50
Aluminum, virgin 99+%, delivered	15.00
Nickel, electrolytic, base refinery	35.00
Magnesium, 99.9+%, carlots	21.50
Magnesium, 12-in. sticks, carlots	30.00
Cadmium, delivered	90.00

ALUMINUM, No. 12 foundry grade (No. 2), 13.50c. per lb.; steel deoxidizing grades, 12.50c. to 13.75c. per lb. ANTIMONY, Asiatic, New York, nominal; American, 14.50c. a lb., f.o.b. Laredo, Tex., smelter. MERCURY, $191 to $193 per 76-lb. flask, f.o.b. shipping point or port of entry. BRASS INGOTS, commercial 85-5-5-5 (No. 115), 12.25c. a lb. COBALT, 97 to 99 per cent, $2.11 per lb. BERYLLIUM COPPER, 3.75 to 4.25 per cent Be., $15 per lb. contained Be. GOLD, U. S. Treasury, $35 an oz. INDIUM, 99.5 per cent, $10 per troy oz. IRIDIUM, $165 per troy oz. PALLADIUM, $24 per troy oz. PLATINUM, $35 per oz. SILVER, open market, New York, 44.75c. per oz. ARSENIC, prime, white, 99 per cent, 4c. per lb.

Copper, Copper Base Alloys

(Mill base prices)

Sheet: Copper, 20.87c.; high brass, 19.48c.; low brass, 80 per cent, 20.15c.; red brass, 85 per cent, 20.36c.; commercial bronze, 90 per cent, 21.07c., 95 per cent, 21.28c.; manganese bronze, 28.00c.; muntz metal, 22.75c.; naval brass, 24.50c.; phosphor bronze, grades A, B, 5 per cent, 36.25c.; Everdur, Herculoy, Olympic or equivalent, 26.00c.; nickel silver, 5 per cent, 26.50c.

Rods: Copper, hot rolled, 17.37c.; drawn, 18.37c.; free cutting brass, 15.01c.; low brass, 80 per cent, 20.40c.; red brass, 85 per cent, 20.61c.; commercial bronze, 90 per cent, 21.32c., 95 per cent, 21.53c.; Muntz metal, 18.87c.; naval brass, 19.12c.; phosphor bronze, grades A, B, 5 per cent, 36.50c.; Everdur, Herculoy, Olympic or equivalent, 25.50c.; nickel silver, 5 per cent, 28.75c.

Extruded Shapes: Copper, 20.87c.; architectural bronze, 19.12c.; manganese bronze, 24.00c.; Muntz metal, 20.12c.; naval brass, 20.37c.

ALUMINUM

Tubing: 2 in. O.D. x 0.065 in. wall 2S, 40c. per lb. (½H); 52S, 61c. (O); 24S, 67½c. (T).

Plate: 0.250 in. and heavier; 2S and 3S, 21.2c. per lb.; 52S, 24.2c.; 61S, 22.8c.; 24S, 24.2c.

Flat Sheet: 0.188 in. thickness; 2S and 3S, 22.7c. a lb.; 52S, 26.2c.; 61S, 24.7c.; 24S, 26.7c.

2000-lb. base price for tubing; 30,000-lb. base price for plate, flat stock. Variations from the above gage, size, temper, finish and quantity require extras.

Extruded Shapes: "As extruded" temper; 2000-lb. base price. 2S and 3S, factor No. 1 to 4, 25.5c. per lb.; 14S, factor No. 1 to 4, 35c.; 17S, factor No. 1 to 4, 31c.; 21S, factor No. 1 to 4, 34c.; 53S, factor No. 1 to 4, 28c.; 61S, factor No. 1 to 4, 28½c.

The factor is determined by dividing perimeter of shape by the weight per lineal foot. All prices above are subject to factor number range, temper, length, dimensional tolerances and quantity extras.

Wire, Rod and Bar: Base price; 17ST and 11ST-3, screw machine stock. Rounds: ¼ in., 28½c. per lb.; ½ in., 26c.; 1 in., 24½c.; 2 in., 23c. Hexagonals: ¼ in., 34½c. per lb.; ½ in., 28½c.; 1 in., 25½c.; 2 in., 25½c. 2S, as fabricated, random or standard lengths, ¼ in., 24c. per lb.; ½ in., 25c.; 1 in., 24c.; 2 in., 23c. 24ST, rectangles and squares, random or standard lengths, 0.093-0.187 in. thick by 1.001-2.000 in. wide, 33c. per lb.; 0.751-1.500 in. thick by 2.001-4.000 in. wide, 29c.; 1.501-2.000 in. thick by 4.001-6.000 in. wide, 27½c.

Variation from the above size, temper, finish and quantity require extras.

MAGNESIUM

Sheet, rod, tubes, bars and extruded shapes are subject to individual quotation. Magnesium Metal Turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.; less than 25 lb., 66c. a lb.

NON-FERROUS SCRAP METAL QUOTATIONS

Copper, Copper Base Alloy

(Current OPA maximum prices, cents per lb., f.o.b. point of shipment, plus premiums for quantities and special preparation.)

OPA Group 1

No. 1 wire, No. 1 heavy copper	9.75
No. 1 tinned copper wire, No. 1 tinned heavy copper	9.75
No. 2 wire, mixed heavy copper	8.75
Copper tuyeres	8.75
Light copper	7.75
Copper borings	9.75
Lead covered copper wire, cable	6.00*
Lead covered telephone, power cable	6.04
Insulated copper	5.10*

OPA Group 2

Bell metal	15.50
High grade bronze gears	13.25
High grade bronze solids	11.50*
Low lead bronze borings	11.50*
Babbitt lined brass bushings	13.00
High lead bronze solids	10.00*
High lead bronze borings	10.00*
Red trolley wheels	10.75
Tinny (phosphor bronze) borings	10.50
Tinny (phosphor bronze) solids	10.50
Copper-nickel solids and borings	9.25
Bronze paper mill wire cloth	9.50
Aluminum bronze solids	9.00
Soft red brass (No. 1 composition)	9.00
Soft red brass borings (No. 1)	9.00
Gilding metal turnings	8.50
Unlined standard red car boxes	8.25
Lined standard red car boxes	7.75
Cocks and faucets	7.75
Mixed brass screens	7.75
Red brass breakage	7.50
Old nickel silver solids, borings	6.25
Copper lead solids, borings	6.25
Yellow brass castings	6.25

OPA Group 3

Yellow brass soft sheet clippings	8.625
Yellow rod brass turnings	8.375
Zincy bronze borings	8.00
Zincy bronze solids	8.00
Fired rifle shells	8.25
Brass pipe	8.00
Old rolled brass	7.75
Admiralty condenser tubes	8.00
Muntz metal condenser tubes	7.50
Plated brass sheet, pipe reflectors	7.50
Manganese bronze solids	7.25[1] 6.25[2]
Manganese bronze borings	6.50[1] 5.50[2]

OPA Group 4

Automobile radiators	7.00

OPA Group 5

Refinery brass	5.00*

*Price varies with analysis. [1] Lead content 0.00 to 0.40 per cent. [2] Lead content 0.41 to 1.00 per cent.

Aluminum

(Current OPA maximum prices, cents per lb., for less than 1000 lb. lots, f.o.b. point of shipment, plus premiums for quantities and special preparation.)

Plant scrap, segregated

2S solids	9.00
All other solids	8.50
Borings and turnings	
Wrought alloys (17S, 18S, 32S, 52S)	7.50
High grade alloys	7.00
Low grade alloys	6.50

Plant scrap, mixed

All solids	7.50
Borings and turnings	5.50

Obsolete scrap

Pure cable	9.00
Old sheet and utensils	7.50
Old castings and forgings	8.00
Pistons, free of struts	8.00
Pistons, with struts	6.00
Old alloy sheet	7.00

For lots of 1000 to 19,999 lb., add 1c. to above prices except for old castings and forgings, pistons free of struts, pistons with struts and old alloy sheet for which there is a premium of ½c. a lb. For lots over 19,999 lb. add 1½c. a lb. to prices listed.

Magnesium

Segregated plant scrap

Pure solids and all other solids, exempt	
Borings and turnings	8.00

Mixed, contaminated plant scrap

Grade 1 solids	11.00
Grade 1 borings and turnings	7.00
Grade 2 solids	9.00
Grade 2 borings and turnings	5.00

For lots over 1499 lb. add 1c. per lb.

Zinc

(Current OPA maximum prices, cents per lb., f.o.b., shipping point.)

New zinc clippings, trimmings	7.25
Engravers', lithographers' plates	7.25
Old zinc scrap	5.75
Unsweated zinc dross	5.80
Die cast slab	5.80
New die cast scrap	4.95
Radiator grilles, old and new	4.95
Old die cast scrap	4.50

Lead

Soft and hard lead, including cable lead, f.o.b. point of shipment, deduct 0.55c. per lb. from basing point prices for refined metal.

Nickel

Nickel content 98 + per cent, copper under ½ per cent, 26c. per lb.; 90 to 98 per cent nickel, 23c. per lb. contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb., f.o.b. shipping point)

Copper: Cast, elliptical, 15 in. and longer	25⅛
Electrolytic, full size	23⅞c.
cut to size	30⅛
Rolled, oval, straight, 15 in. and longer	23¼
Curved	24¼
Brass: Cast, 82-20, elliptical, 15 in. and longer	23⅝
Zinc: Cast, 99.99, 16 in. and over	16¼
Nickel: 99% plus, cast	47
Rolled, depolarized	48
Silver: Rolled, 999 fine per Troy (1-9) oz., per oz.	58

Chemicals

(Cents per lb., delivery from New York)

Copper cyanide, tech., 100-lb. bbls. 1-5	5.65
Copper sulphate, 99.5 crystals, bbls.	13.00–13.50
Nickel salts, single, 425-lb. bbls.	34.00
Silver cyanide, 100 oz. lots	40.82–41.125
Sodium cyanide, 96% dom., 100-lb. dms.	0.15
Zinc cyanide, 100-lb. dms.	33.00
Zinc sulphate, 89% crystals, bbls.	6.80

SCRAP

. . . News and Market Activities

P-136 Covers Ratings for Scrap Trade

• • • Use of preference ratings by scrap metal processors for maintenance, repairs, and operating supplies is now controlled by Order P-136 as revised Aug. 11 instead of CMP Regulation No. 5, it was announced by WPB. Scrap metal processors are persons operating scrap yards or automobile graveyards in the United States and Canada. Provisions of the revised P-136 are as follows:

1. Processors of metal scrap must obtain a certificate and serial number before they are eligible to use the AA-2 priority rating for the purchase of maintenance, repair and operating supplies.

2. Minor capital additions obtainable under the order are restricted to $250 rather than to $500, as in CMP Reg. 5.

3. A slightly different certificate is to be used in lieu of the endorsements specified in CMP Reg. 5, or 7. A copy of that certificate is incorporated in the revised order.

4. The quantity restriction of CMP Reg. 5, limiting purchases in 1943 to 100 per cent of similar purchases of 1942, has been changed in the revised order to 120 per cent of 1942.

5. Under CMP Reg. 5 those processors whose aggregate requirements for maintenance, repair and operating supplies do not exceed $5,000 per year are exempt from the quantity restrictions. Under the Revision of P-136, the $5,000 amount has been reduced to $500 in the case of scrap metal processors.

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Warned on Explosives

• • • Suppliers of scrap iron and steel to Bethlehem Steel Co. were cautioned in a letter sent out Aug. 10 by the company's purchasing division to be on the watch against the inclusion in scrap shipments of "loaded shells, bombs or other explosives."

(In last week's issue of this magazine, an unnamed official of the War Department was quoted as saying investigations had shown that recent explosions were not caused by live ammunition in battlefield scrap, and that no fears need be held because the scrap is thoroughly inspected.)

"Large quantities of iron and steel scrap are now being shipped from shell-loading plants, arsenals, proving grounds, and similar establishments," the Bethlehem letter stated. A further hazard that the letter likewise anticipates is from so-called war-front scrap.

All producers and dealers in scrap iron and steel, regardless of the mills to which they may be shipping, were urged in the letter to exercise every possible precaution to avoid including in their shipments any closed pieces or containers that might hold concealed explosives. It was said scrap handlers should also keep in mind the possibility of the inclusion in scrap of filled or partially filled oxygen and acetylene tanks which could have as destructive effect as military explosives.

"This company's scrap inspectors have been cautioned to be on the alert for such hazards," the letter stated, "but it is obviously not feasible for them to inspect every piece of scrap in every car. Unless vigilance is exercised by both scrap producers and dealers, scrap containing explosives might escape notice and, when charged into a furnace, cause serious or fatal injuries and loss of steel production."

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Auto Graveyard Scrap Off

Cleveland

• • • Auto graveyards, normally an important source of iron and steel scrap, seem to be drying up. Tonnage moved dropped 41 per cent in June from May, and July tonnage is expected to continue this downward trend. Coal strikes in May and June help further deplete what were barely comfortable scrap supplies, and with this source now disappearing, anxiety is felt for the late winter months as far as scrap supplies are concerned.

•

General Market

Despite the apparent easy tone in the scrap market in some areas there are other locations notably Pittsburgh, Cleveland, Youngstown and Chicago where scrap authorities honestly believe a moderate sized "run" on the market would prove an underlying tightness. Most of this situation has been caused by the shortage in the coke picture. The coal strikes caused some of this but for months the coke outlook has been anything but bright. This in turn has cut down the amount of pig iron and placed more reliance on scrap. While there will be no serious shortage according to some, there is a distinct possibility that in a month or two scrap will certainly not be plentiful.

SCRAP HOUND: This device, which magnetically picks up metal objects from factory floors and thereby averts punctured tires, has been developed from a standard Jeep engine by conservation engineers at Willys-Overland Motors. The magnet is capable of lifting 700 lb. In four days this device picked up 3145 lb. of metal.

IRON AND STEEL (OTHER THAN RAILROAD) SCRAP

(All Prices Are Per Gross Ton)

	BASIC OPEN HEARTH GRADES		BLAST FURNACE GRADES				ELECTRIC FURNACE, ACID OPEN HEARTH AND FOUNDRY GRADES									
							Low Phos.		Heavy Structural and Plate			Foundry Steel				
	No. 1 & 2 Hvy. Melt. No. 1 Co. Blk. Shts. No. 1 & 2 Bundles No. 1 Busheling	Unbaled* Machine Shop Turnings	Mixed Borings and Turnings	Cast Iron Borings	Shovelling Turnings	No. 2 Busheling	Billet, Bloom, Forge Crops	Bar Crops, Punchings Plate Scrap and Cast Steel	3 ft. and Under	2 ft. and Under	1 ft. and Under	2 ft. and Under	1 ft. and Under	Auto. Springs, and Crankshafts	Alloy Free Low Phos. and Sulphur Turnings	Heavy Axle and Forge Turn. First Cut	Electric Furnace Bundles
Pittsburgh, Brackenridge, Butler, Monessen, Midland, Johnstown, Sharon, Canton, Steubenville, Warren, Youngstown, Weirton	$20.00	$15.00	$15.00	$16.00	$17.00	$17.50	$25.00	$22.50	$21.50	$22.00	$22.50	$21.50	$22.00	$21.00	$18.00	$19.50	$21.00
Cleveland, Middletown, Cincinnati, Portsmouth	19.50	14.50	14.50	15.50	16.50	17.00	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	17.50	19.00	20.50
Chicago, Claymont, Coatesville, Conshohocken, Harrisburg, Phoenixville, Sparrows Point	18.75	13.75	13.75	14.75	15.75	16.25	23.75	21.25	20.25	20.75	21.25	20.25	20.75	19.75	16.75	18.25	19.75
Ashland, Ky.	19.50	14.50	14.50	15.50	16.50	17.00	24.50	22.00	21.00	21.50	22.00	21.00	21.50	20.50	17.50	19.00	20.50
Buffalo, N. Y.	19.25	14.25	14.25	15.25	16.25	16.75	24.25	21.75	20.75	21.25	21.75	20.75	21.25	20.25	17.25	18.75	20.25
Bethlehem, Pa.; Kokomo, Ind.	18.25	13.25	13.25	14.25	15.25	15.75	23.25	20.75	19.75	20.25	20.75	19.75	20.25	19.25	16.25	17.75	19.25
Duluth, Minn.	18.00	13.00	13.00	14.00	15.00	15.50	23.00	20.50	19.50	20.00	20.50	19.50	20.00	19.00	16.00	17.50	19.00
Detroit, Mich.	17.85	12.85	12.85	13.85	14.85	15.35	22.85	20.35	19.35	19.85	20.35	19.35	19.85	18.85	15.85	17.35	18.85
Toledo, Ohio	.....	12.85	12.85	13.85	14.85	15.35	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
St. Louis, Mo.	17.50	12.50	12.50	13.50	14.50	15.00	22.50	20.00	19.00	19.50	20.00	19.00	19.50	18.50	15.50	17.00	18.50
Atlanta, Ga.; Alabama City, Ala.; Birmingham, Los Angeles; Pittsburg, Cal.; San Francisco	17.00	12.00	12.00	13.00	14.00	14.50	22.00	19.50	18.50	19.00	19.50	18.50	19.00	18.00	15.00	16.50	18.00
Minnequa, Colo.	16.50	11.50	11.50	12.50	13.50	14.00	21.50	19.00	18.00	18.50	19.00	18.00	18.50	17.50	14.50	16.00	17.50
Seattle, Wash.	14.50	9.50	9.50	10.50	11.50	12.00	19.50	17.00	16.00	16.50	17.00	16.00	16.00	15.00	12.50	14.00	15.50

*Baled turnings are $5 per gross ton higher.

BUNDLES: Tin can bundles are $4 below dealers' No. 2 bundles No. 3 bundles are $2 less than No. 1 heavy melting.

AT NEW YORK city or Brooklyn, the maximum shipping point price is $15.33 for No. 1 heavy melting, f.o.b. cars, f.a.s. vessel or loaded on truck. Minimum set at $14 per gross ton at any shipping point in U. S. Other grades carry differentials similar to those in table. New Jersey prices must be computed on basis of all-rail. At Boston the maximum is $15.05 for No. 1 f.o.b. cars, f.a.s. vessel or loaded on trucks. Shipments from a New England shipping point to a consumer outside New England carry maximum transportation charge of $6.66 per ton.

SWITCHING CHARGES: Deductions for shipping points within basing points (cents per gross ton) are: Pittsburgh, Brackenridge, 55c.; Midland, Johnstown, Sharon, Youngstown, Warren, Weirton, Cleveland, Toledo, Los Angeles, San Francisco, 42c.; Butler, Monessen, Canton, Steubenville, Cincinnati*, Portsmouth, Ashland, Coatesville, Harrisburg, Phoenixville, Bethlehem, Kokomo, Duluth, St. Louis, 28c.; Buffalo, Claymont, 36c.; Conshohocken, 11c.; Atlanta, Birmingham, 32c.; Pittsburg, Cal., 42c.; Middletown, 14c.; Sparrow's Point, 11c.; Chicago, 84c.; Detroit, 53c.; Alabama City, 26c.; Minnequa, 22c.; Seattle, 38c. *At Cincinnati, for basic open hearth grades, foundry steel and auto springs and crankshafts, deduct 80c. per ton.

PITTSBURGH basing point includes switching districts of Bessemer, Homestead, Duquesne, Munhall and McKeesport, Cincinnati basing point includes Newport, Ky., switching district. St. Louis includes switching districts of Granite City, East St. Louis, Madison, Ill. San Francisco includes switching districts of S. San Francisco, Niles and Oakmont, Cal. Claymont, Del., includes the switching point of Chester, Pa. Chicago includes Gary, Ind., switching district.

MAXIMUM SHIPPING POINT PRICE—Where shipment is by rail or vessel, or by combination of rail and vessel, the scrap is at its shipping point when placed f.o.b. railroad or f.a.s. vessel. In such cases, the maximum shipping point prices shall be: (a) For shipping points located within a basing point, the price listed in the table above for the scrap at the basing point in which the shipping point is located, minus the lowest established switching charge for scrap within the basing point and (b) for shipping points located outside the basing point, the price in table above at the most favorable basing point minus the lowest transportation charge by rail or water or combination thereof. In lieu of dock charge add 75c. a ton*, but 50c. if moved by deck scow or railroad lighter. Shipping by motor vehicle: The scrap is at its shipping point when loaded. For shipping points located within basing points take price listed in table minus applicable switching charge. If located outside a basing point, the price at the most favorable basing point minus lowest established charge for transporting by common carrier. If no established transportation rate exists, the customary costs are deducted. Published dock charges prevail. If unpublished include 75c.* For exceptions see official order.

UNPREPARED SCRAP: For unprepared scrap, maximum prices shall be $3.50 (and in the case of the material from which No. 1, No. 2, and No. 3 bundles are made $4) less maximum prices for the corresponding grade or grades of prepared scrap. In no case, however, shall electric furnace and foundry grades be used as the "corresponding grade or grades of prepared scrap." Converter may charge $2.50 per ton on consumer-owned unprepared remote scrap (see order). A preparation-in-transit charge for allocated unprepared scrap is provided.

NEW LISTED GRADES: Priced in dollars per gross ton less than No. 1 heavy melting steel. Pit scrap, ladle skulls, slag reclaim, etc., of 85% or more Fe priced—$2; 75 to 85% Fe—$4; under 75% Fe—$8 per ton. Mill scale of 65% or more Fe—$8 per ton. Mill cinder and grindings, shipping point maximum price of $4 per gross ton at all U. S. shipping points.

CHEMICAL BORINGS: No. 1 (new, clean, containing not more than 1 per cent oil), $1 less than No. 1 heavy melting; No. 2 (new, clean, containing not more than 1.5 per cent oil), $2 less than No. 1 heavy melting. If loaded in box cars add 75c.

*At Memphis 50c.; Great Lakes ports $1; New England $1.25.

RAILROAD SCRAP

	No. 1 RR Heavy Melting	Scrap Rails	Rails for Rerolling	Scrap Rails: 3 ft. and Under	Scrap Rails: 2 ft. and Under	Scrap Rails: 18 in. and Under
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown	$20.50	$21.50	$23.00	$23.50	$23.75	$24.00
Canton, Pittsburgh, Sharon, Steubenville, Wheeling, Youngstown	21.00	22.00	23.50	24.00	24.25	24.50
Chicago, Philadelphia, Sparrows Pt., Wilmington	19.75	20.75	22.25	22.75	23.00	23.25
Birmingham, Los Angeles, San Francisco	18.00	19.00	20.50	21.00	21.25	21.50
Buffalo	20.25	21.25	22.75	23.25	23.50	23.75
Detroit	18.85	19.85	21.35	21.85	22.10	22.35
Duluth	19.00	20.00	21.50	22.00	22.25	22.50
Kansas City, Mo.	17.00	18.00	19.50	20.00	20.25	20.50
Kokomo, Ind.	19.25	20.25	21.75	22.25	22.50	22.75
Seattle	15.50	16.50	18.00	18.50	18.75	19.00
St. Louis	18.50	19.50	21.00	21.50	21.75	22.00

CAST IRON SCRAP

	Group A	Group B	Group C
No. 1 cupola cast	$18.00	$19.00	$20.00
Clean auto cast	18.00	19.00	20.00
Unstripped motor blocks	15.50	16.50	17.50
Stove Plate	17.00	18.00	19.00
Heavy Breakable Cast	15.50	16.50	17.50
Charging Box Size Cast	17.00	18.00	19.00
Misc. Malleable	20.00	21.00	22.00

Group A includes the states of Montana, Idaho, Wyoming, Nevada, Utah, Arizona and New Mexico.

Group B includes the states of North Dakota, South Dakota, Nebraska, Colorado, Kansas, Oklahoma, Texas and Florida.

Group C: States not named in A and B: switching district of Kansas City, Kan., Mo.

Tool Steel Scrap Ceiling Prices Set by MPR 379, May 4, 1943

BASE PRICE SEGREGATED

	Solids, Lb. Cont. W	Turnings, Lb. Cont. W
Type 1	$1.80	$1.60
Type 2	1.60	1.40
Type 3	1.25	1.25
Type 4*	0.125	0.105
Type 5*	0.135	0.115

*Per lb. of scrap material.

BASE PRICE UNSEGREGATED SOLIDS

$1.50 per lb. contained W if 5% or more.

$1.15 per lb. contained W if over 1% and less than 5%.

$0.80 per lb. contained Mo if 1½% or more.

BASE PRICE UNSEGREGATED TURNINGS

$1.30 per lb. contained W if 5% or more.

$1.00 per lb. contained W if 1% and less than 5%.

$0.70 per lb. contained Mo if 1½% or more.

Comparison of Prices . . .

Advances Over Past Week in **Heavy Type**; Declines in *Italics*. [Prices Are F.O.B. Major Basing Points]

Flat Rolled Steel: (Cents Per Lb.)	Aug. 17, 1943	Aug. 10, 1943	July 20, 1943	Aug. 16, 1942
Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Plates, wrought iron	3.80	3.80	3.80	3.80
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00
Tin and Terne Plate: (Dollars Per Base Box)				
Tin plate, standard cokes	$5.00	$5.00	$5.00	$5.00
Tin plate, electrolytic	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30
Bars and Shapes: (Cents Per Lb.)				
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars	4.40	4.40	4.40	4.40
Wire and Wire Products: (Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55
Rails: (Dollars Per Gross Ton)				
Heavy rails	$40.00	$40.00	$40.00	$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel: (Dollars Per Gross Ton)				
Rerolling billets	$34.00	$34.00	$34.00	$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00
Wire Rods and Skelp: (Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	2.00
Skelp (grvd)	1.90	1.90	1.90	1.90

Pig Iron: (Per Gross Ton)	Aug. 17, 1943	Aug. 10, 1943	July 20, 1943	Aug. 16, 1942
No. 2 fdy., Philadelphia	$25.84	$25.84	$25.89	$25.89
No. 2, Valley furnace	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti	24.68	24.68	24.68	24.68
No. 2, Birmingham	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa.	25.39	25.39	25.39	25.39
Basic, Valley furnace	23.50	23.50	23.50	23.50
Malleable, Chicago†	24.00	24.00	24.00	24.00
Malleable, Valley	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago	31.34	31.34	31.34	31.34
Ferromanganese‡	135.00	135.00	135.00	135.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.
‡For carlots at seaboard.

Scrap: (Per Gross Ton)	Aug. 17, 1943	Aug. 10, 1943	July 20, 1943	Aug. 16, 1942
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.85
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	20.00
No. 1 cast, Ch'go	20.00	20.00	20.00	20.00
Coke, Connellsville: (Per Net Ton at Oven)				
Furnace coke, prompt	$6.50	$6.50	$6.50	$6.00
Foundry coke, prompt	7.50	7.375	6.875	6.875
Non-Ferrous Metals: (Cents per Lb. to Large Buyers)				
Copper, electro., Conn.	12.00	12.00	12.00	12.00
Copper, Lake, New York	12.00	12.00	12.00	12.00
Tin (Straits), New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	6.35	6.35	6.35	6.35
Aluminum, Virgin, del'd.	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	22.50
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 149-159.

Composite Prices . . .

	FINISHED STEEL	PIG IRON	SCRAP STEEL
August 17, 1943	2.25513c. a Lb.	.....23.61 a Gross Ton	.....$19.17 a Gross Ton
One week ago	2.25513c. a Lb.	.....23.61 a Gross Ton	.....$19.17 a Gross Ton
One month ago	2.25513c. a Lb.	.....23.61 a Gross Ton	.....$19.17 a Gross Ton
One year ago	2.26190c. a Lb.	.....23.61 a Gross Ton	.....$19.17 a Gross Ton

	HIGH	LOW
1943	2.25513c.,	2.25513c.,
1942	2.26190c.,	2.26190c.,
1941	2.43078c.,	2.43078c.,
1940	2.30467c., Jan. 2	2.24107c., Apr. 16
1939	2.35367c., Jan. 3	2.26689c., May 16
1938	2.58414c., Jan. 4	2.27207c., Oct. 18
1937	2.58414c., Mar. 9	2.32263c., Jan. 4
1936	2.32263c., Dec. 28	2.05200c., Mar. 10
1935	2.07642c., Oct. 1	2.06492c., Jan. 8
1934	2.15367c., Apr. 24	1.95757c., Jan. 2
1933	1.95578c., Oct. 3	1.75836c., May 2
1932	1.89196c., July 5	1.83901c., Mar. 1
1931	1.99626c., Jan. 13	1.86586c., Dec. 29
1930	2.25488c., Jan. 7	1.97319c., Dec. 9
1929	2.31773c., May 28	2.26498c., Oct. 29

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

HIGH	LOW
$23.61	$23.61
23.61	23.61
$23.61, Mar. 20	$23.45, Jan. 2
23.45, Dec. 23	22.61, Jan. 2
22.61, Sept. 19	20.61, Sept. 12
23.25, June 21	19.61, July 6
23.25, Mar. 9	20.25, Feb. 16
19.74, Nov. 24	18.73, Aug. 11
18.84, Nov. 5	17.83, May 14
17.90, May 1	16.90, Jan. 27
16.90, Dec. 5	13.56, Jan. 3
14.81, Jan. 5	13.56, Dec. 6
15.90, Jan. 6	14.79, Dec. 15
18.21, Jan. 7	15.90, Dec. 16
18.71, May 14	18.21, Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

HIGH	LOW
$19.17	$19.17
19.17	19.17
$22.00, Jan. 7	$19.17, Apr. 10
21.83, Dec. 30	16.04, Apr. 9
22.50, Oct. 3	14.08, May 16
15.00, Nov. 22	11.00, June 7
21.92, Mar. 30	12.67, June 9
17.75, Dec. 21	12.67, June 9
13.42, Dec. 10	10.33, Apr. 29
13.00, Mar. 13	9.50, Sept. 25
12.25, Aug. 8	6.75, Jan. 3
8.50, Jan. 12	6.43, July 5
11.33, Jan. 6	8.50, Dec. 29
15.00, Feb. 18	11.25, Dec. 9
17.58, Jan. 29	14.08, Dec. 8

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

. . . Prices of Finished Iron and Steel

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. On some products either quantity deductions or quantity extras apply. In many cases gage, width, cutting, physical, chemical extras, etc., apply to the base price. Actual realized prices to the mill, therefore, are affected by extras, reductions, and in most cases freight absorbed to meet competition. Delivered prices do not reflect new 3 per cent tax on freight rates.

Basing Point → / Product ↓	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	Pacific Ports, Cars[10]	DELIVERED TO Detroit	New York	Philadelphia
SHEETS															
Hot rolled	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold rolled[1]	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized (24 ga.)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling (20 ga.)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	3.67¢
Long ternes[2]	3.80¢		3.80¢									4.55¢		4.16¢	4.12¢
STRIP															
Hot rolled[3]	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold rolled[4]	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.90¢	3.16¢	
Cooperage stock	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity C-R	2.95¢	3.05¢		2.95¢			2.95¢	(Worcester = 3.35¢)					3.05¢	3.31¢	
TIN MILL PRODUCTS															
Coke tin plate, base box	$5.00	$5.00	$5.00						$5.10					5.36¢	5.32¢
.50 Electro tin plate, box	$4.50	$4.50	$4.50												
.75 Electro tin plate, box	$4.65		$4.65												
Black plate, 29 gage[5]	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢[12]			3.37¢
Mfg. ternes, special box	$4.30	$4.30	$4.30						$4.40						
BARS															
Carbon steel	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail steel[6]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (billet)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢[13]	2.25¢	2.39¢	
Reinforcing (rail)[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	2.55¢[13]	2.25¢		2.47¢
Cold finished[8]	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢			(Detroit = 2.70¢)					2.99¢	2.97¢
Alloy, hot rolled	2.70¢	2.70¢				2.70¢	(Bethlehem, Massillon, Canton = 2.70¢)						2.80¢		
Alloy, cold drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.45¢		
PLATES							(Coatesville and Claymont = 2.10¢)								
Carbon steel	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	2.35¢		2.45¢	2.65¢	2.31¢	2.29¢	2.15¢
Floor plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	3.67¢
Alloy	3.50¢	3.50¢			(Coatesville = 3.50¢)						3.95¢	4.15¢		3.70¢	3.59¢
SHAPES															
Structural	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢	(Bethlehem = 2.10¢)				2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL, C-R															
0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester = 3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester = 4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester = 6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8.35¢			(Worcester = 8.55¢)								
WIRE[9]															
Bright[14]	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)					3.10¢			2.92¢
Galvanized	add proper size extra and galvanized extra to bright wire base, above.														
Spring (High Carbon)	3.20¢	3.20¢		3.20¢			(Worcester = 3.30¢)					3.70¢			3.52¢
PILING															
Steel sheet	2.40¢	2.40¢				2.40¢						2.95¢			2.72¢

[1] Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base. [2] Unassorted 8-lb. coating. [3] Widths up to 12 in. [4] Carbon 0.25 per cent and less. [5] Applies to certain width and length limitations. [6] For merchant trade. [7] Prices for straight length material only, from a producer to a consumer. Functional discount of 25c. per 100 lb. to fabricators. [8] Also shafting. For quantities of 20,000 to 29,999 lb. [9] Carload lot to manufacturing trade. [10] These prices do not apply if the customary means of transportation (rail and water) are not used. [12] Boxed. [13] Portland and Seattle price, San Francisco price is 2.50c. [14] This bright wire base price to be used in figuring annealed and bright finish wires, commercial spring wire and galvanized wire.

GOVERNMENT CEILING—Price Schedule No. 6 issued April 16, 1941, governs steel mill prices; Price Schedule No. 49 governs warehouse prices which are on another page of this issue.

EXCEPTIONS TO PRICE SCHEDULE No. 6—On hot rolled carbon bars, Phoenix Iron Co. may quote 2.35c. at established basing points, Calumet Steel division of Borg Warner may quote 2.35c., Chicago, on bars from its 8-in. mill; Joslyn Mfg. Co. may quote 2.35c., Chicago base. On rail steel bars Sweets Steel Co. may quote 2.35c., f.o.b. mill. On hot rolled sheets, Andrews Steel Co. may quote for shipment to Detroit area on Middletown base. On galvanized sheets, Andrews Steel may quote 3.75c., at established basing points. On hot rolled strip, Joslyn Mfg. Co. may quote 2.30c., Chicago base. On plates, Granite City Steel Co. may quote 2.35c., f.o.b. mill, and Central Iron & Steel Co. may quote 2.20c., f.o.b. basing points. On shapes, Phoenix Iron Co. may quote 2.30c. established basing points and 2.50c. Phoenixville for export.

On rail steel merchant bars, Eckels-Nye Corp. may charge 2.40c. On tubing, South Chester Tube Co. may price Gulf or Pacific Coast all-rail shipments and shipments west of Harrisburg on basis of f.o.b. Chester. On lend-lease sales to eastern seaboard, Sheffield Steel Co. and Colorado Fuel & Iron Corp. may sell f.o.b. mill. SEMIFINISHED STEEL—Follansbee Steel Corp. may sell forging billets at $49.50 f.o.b. Toronto; Continental Steel Corp. may sell Acme Steel Co. at $34 for rerolling billets plus extras and freight; Ford Motor Co. may sell rerolling billets at $34 f.o.b. Dearborn; Andrews Steel Co. may sell forging billets at $50 at established basing points and slabs at $41; Empire Sheet and Tin Plate may sell slabs at $41 at established basing points and sheet bars at $39 f.o.b. mill; on lend-lease sales Northwestern Steel & Wire Co. may charge $41 per gross ton f.o.b. mill for rerolling billets; on lend-lease sales Wheeling Steel Corp. may charge $36 per ton for small billets, f.o.b. Portsmouth and $37 per ton for sheet bars f.o.b. Portsmouth; Laclede Steel Co. on semifinished sales for lend-lease shipped to eastern seaboard may use Chicago basing point prices f.o.b. Alton and Madison, Ill. ALLOY STEEL BARS—Texas Steel Co. may use Chicago base f.o.b. Fort Worth.

WAREHOUSE PRICES

(Delivered Metropolitan areas, per 100 lb. These prices do not necessarily apply for dislocated tonnage shipments when the f.o.b. City prices are used in conformance with OPA Schedule 49)

Cities	SHEETS			STRIP		Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 gage)	Cold Rolled	Galvanized (24 gage)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	†† Hot Rolled, 2300	‡ Hot Rolled, 3100	†† Cold Drawn, 2300	‡ Cold Drawn, 3100
*Philadelphia	$3.518	$4.872[5]	$5.018	$3.922	$4.772	$3.605	$3.666	$3.822	$4.072		$7.116		
*New York	3.590	4.613[2]	5.010	3.974[6]	4.774	3.768	3.758	3.853	4.103	6.008	7.158	7.303	8.453
*Boston	3.774	4.744	5.224	4.106	4.715	3.912	3.912	4.044	4.144	6.162	7.312	7.344	8.494
*Baltimore	3.394	4.852	4.894	3.902	4.752	3.594	3.759	3.802	4.052	....	....	....	....
*Norfolk	3.771	4.965	5.371	4.165	4.865	3.971	4.002	4.065	4.165	....	....	....	....
*Washington	3.596	4.841	5.196	4.041	4.741	3.796	3.930	3.941	4.041				
*Chicago	3.25	4.20	5.23[4]	3.60	4.65[8]	3.55	3.55	3.50	3.75	5.75	6.90	6.85	8.00
*Milwaukee	3.387	4.337[2]	5.272[4]	3.737	4.787[8]	3.687	3.687	3.637	3.887	5.987	7.137	7.087	8.237
*Cleveland	3.35	4.40	4.877[4]	3.60	4.45	3.40	3.588	3.35	3.75	5.956	7.106	6.85	8.00
*Buffalo	3.35	4.40	4.754	3.819	4.669	3.63	3.40	3.35	3.75	5.75	6.90	6.85	8.00
*Detroit	3.45	4.50	5.004	3.70	5.909[8]	3.609	3.661	3.45	3.80	6.08	7.23	7.159	8.309
*Cincinnati	3.425	4.475[2]	4.825[1]	3.675	4.711	3.611	3.691	3.611	4.011				
*St. Louis	3.397	4.247[2]	5.172[4]	3.747	4.931[8]	3.697	3.697	3.647	4.031	6.131	7.281	7.231	8.381
*Pittsburgh	3.35	4.40	4.75	3.60	4.45	3.40	3.40	3.35	3.75	5.75	7.15	6.85	8.25
*St. Paul	3.51	4.46	5.257[4]	3.86	4.35[8]	3.81[9]	3.81[9]	3.76[9]	4.361	....	....	....	....
*Omaha	3.865	5.443	5.608[4]	4.215		4.165	4.165	4.115	4.443	....	....	....	....
*Indianapolis	3.58	3.58	4.568	4.918	3.768	4.78	3.63	3.58	3.98	6.08	7.23	7.18	8.33
Birmingham	3.45[3]		4.75[1]	3.70[3]	....	3.55[3]	3.55[3]	3.50[3]	4.43	....	....	....	....
Memphis	3.85	4.66	5.25	4.10	....	3.95	3.95	3.90	4.31	....	....	....	....
New Orleans	3.95	4.95	5.25	4.20	....	3.90	3.90	4.10	4.60	....	....	....	....
Houston	3.75	5.43	5.25	4.30	....	5.25	5.25	3.75	4.50	....	....	....	....
†Los Angeles	4.95	7.15	5.95	4.90	....	4.90	4.60	4.35	5.70	9.55	8.55	10.55	9.55
†San Francisco	4.55	7.55	6.60	4.50	....	4.65	4.35	3.95	5.55	9.80	8.80	10.80	9.80
†Seattle	4.65[7]	6.63	5.70[7]	4.25	....	4.75	4.45	4.20	5.75	....	8.00	....	....

NATIONAL EMERGENCY (N. E.) STEELS

(Hot Rolled Mill Extras for Alloy Content)

Designation	CHEMICAL COMPOSITION LIMITS, PER CENT								Basic Open-Hearth		Electric Furnace	
	Carbon	Manganese	Phosphorus Max.	Sulphur Max.	Silicon	Chromium	Nickel	Molybdenum	Bars and Bar Strip	Billets, Blooms and Slabs	Bars and Bar Strip	Billets, Blooms and Slabs
NE 1330	.28/ .33	1.60/1.90	.040	.040	.20/ .35				.10c	$2.00		
NE 1335	.33/ .38	1.60/1.90	.040	.040	.20/ .35				.10	2.00		
NE 1340	.38/ .43	1.60/1.90	.040	.040	.20/ .35				.10	2.00		
NE 1345	.43/ .48	1.60/1.90	.040	.040	.20/ .35				.10	2.00		
NE 1350	.48/ .53	1.60/1.90	.040	.040	.20/ .35				.10	2.00		
NE 8020	.18/ .23	1.00/1.30	.040	.040	.20/ .35			.10/ .20	.45	9.00	.95c	$19.00
NE 8442*	.40/ .45	1.30/1.60	.040	.040	.20/ .35			.30/ .40	.90	18.00	1.40	28.00
NE 8613	.12/ .17	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8615	.13/ .18	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.16/ .25	.75	15.00	1.25	25.00
NE 8617	.15/ .20	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8620	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8630	.28/ .33	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	15/ .25	.75	15.00	1.25	25.00
NE 8635	.33/ .38	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8637	.35/ .40	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8640	.38/ .43	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8642	.40/ .45	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ 25	.75	15.00	1.25	25.00
NE 8645	.43/ .48	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8650	.48/ .53	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8720	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.20/ .30	.80	16.00	1.30	26.00
NE 9255	.50/ .60	.70/ .95	.040	.040	1.80/2.20				.40c	8.00		
NE 9260	.55/ .65	.75/1.00	.040	.040	1.80/2.20				.40	8.00		
NE 9262	.55/ .65	.75/1.00	.040	.040	1.80/2.20	.20/ .40			.65	13.00		
NE 9415	.13/ .18	.80/1.10	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30c	$26.00
NE 9420	.18/ .23	.80/1.10	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9422	.20/ .25	.80/1.10	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9430	.28/ .33	.90/1.20	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9435	.33/ .38	.90/1.20	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9437	.35/ .40	.90/1.20	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9440	.38/ .43	.90/1.20	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.80	16.00	1.30	26.00
NE 9442	.40/ .45	1.00/1.30	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.85	17.00	1.35	27.00
NE 9445	.43/ .48	1.00/1.30	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.85	17.00	1.35	27.00
NE 9450	.48/ .53	1.20/1.50	.040	.040	.40/ .60	.20/ .40	.20/ .50	.08/ .15	.85	17.00	1.35	27.00
NE 9537*	.35/ .40	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9540*	.38/ .43	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9542*	.40/ .45	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9550*	.48/ .53	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9630	.28/ .33	1.20/1.50	.040	.040	.40/ .60	.40/ .60			.80	16.00	1.30	26.00
NE 9635	.33/ .38	1.20/1.50	.040	.040	.40/ .60	.40/ .60			.80	16.00	1.30	26.00
NE 9637	.35/ .40	1.20/1.50	.040	.040	.40/ .60	.40/ .60			.80	16.00	1.30	26.00
NE 9640	.38/ .43	1.20/1.50	.040	.040	.40/ .60	.40/ .60			.80	16.00	1.30	26.00
NE 9642	.40/ .45	1.30/1.60	.040	.040	.40/ .60	.40/ .60			.85	17.00	1.35	27.00
NE 9645	.43/ .48	1.30/1.60	.040	.040	.40/ .60	.40/ .60			.85	17.00	1.35	27.00
NE 9650	.48/ .53	1.30/1.60	.040	.040	.40/ .60	.40/ .60			.85	17.00	1.35	27.00

BASE QUANTITIES: Hot rolled sheets, cold rolled sheets, hot rolled strip, plates, shapes and hot rolled bars, 400 to 1999 lb.; galvanized sheets, 150 to 1499 lb.; cold rolled strip, extras apply on all quantities; cold finished bars, 1500 lb. and over; SAE bars, 1000 lb. and over: Exceptions: [1] 500 to 1499 lb. [2] 400 to 1499 lb. [3] 400 to 3999 lb. [4] 450 to 1499 lb. [5] 1000 to 1999 lb. [6] 0 to 1999 lb. [7] 300 to 10,000 lb. [8] 2000 to 39,999 lb. [9] 400 to 14,999 lb. At Philadelphia galvanized sheets, 2500 more bundles; Boston, cold rolled and galvanized sheets, 450 to 3749 lb.; San Francisco, hot rolled sheets, 400 to 39,999 lb.; galvanized and cold rolled sheets, 750 to 4999 lb.; cold fin. bars, 0-299 lb.; hot rolled alloy bars, 0-4999 lb.; Seattle, cold finished bars, 1000 lb. and over, hot rolled alloy bars, 0-1999 lb.; Memphis, hot rolled sheets, 400 to 1999 lb., galvanized sheets, 150 and over; Los Angeles, hot rolled sheets, bars, plates, cold rolled sheets, 300 to 1999 lb.; galvanized sheets, 1 to 6 bundles; cold finished bars, 1 to 99 lbs.; SAE bars, 100 lb. Extras for size, quality, etc., apply on above quotations.

† Los Angeles, San Francisco and Seattle prices reflect special provisions of amendment No. 2 to OPA Price Schedule No. 49.

†† For zoned cities these grades have been revised to NE 8617-20.

‡ For zoned cities these grades have been revised to NE 9442-45 Ann'ld.

* Base delivered prices according to price zones established by Amendments to RPS 49 including the 3% transportation tax—not including the 6% freight increase of March 18, 1942, rescinded May 15, 1943.

***Recommended for large sections only. Note: The extras shown above are in addition to a base price of 2.70c. per 100 lb., on finished products and $54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished. When acid open-hearth is specified and acceptable add to basic open hearth alloy differential 0.25c. per lb. for bars and bar strip, $5.00 per gross ton for billets, blooms and slabs. The ranges shown above are restricted to sizes 100 sq. in. or less or equivalent cross sectional area 18 in. wide or under with a max. individual piece weight of 7000 lb.**

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are $2.00 higher; f.o.b. Duluth, billets only, $2 higher. Delivered prices do not reflect new per cent tax on freight rates.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00
Alloy Steel: Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton	$54.00

Shell Steel

	Per Gross Ton
3 in. to 12 in.	$52.00
12 in. to 18 in.	54.00
18 in. and over	56.00

Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham. Prices delivered Detroit are $2.00 higher.

Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Lb.
Pittsburgh, Chicago, Cleveland	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

TOOL STEEL

(F.o.b. Pittsburgh, Bethlehem, Syracuse)

	Base per lb.
High speed	67c.
Straight molybdenum	54c.
Tungsten-molybdenum	57½c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi, 3c. higher.

CORROSION AND HEAT-RESISTING STEEL

(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 202
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F.Billets	15.725c.	16.15c.	19.125c.	23.375c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hotstrip	17.00c.	17.50c.	24.00c.	35.00c.
Cold st.	22.00c.	22.50c.	32.00c.	52.00c.

Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling.

ROSS CARRIERS and LIFT TRUCKS

HANDLE LONG MATERIAL *FASTER* and at *LESS COST!*

THE speed with which materials can be fed to the production lines often determines the productive capacity of a plant. In scores of America's war plants ROSS 70-H Carriers and ROSS Industrial Lift Trucks are important links in the production set-up, bridging the gaps between warehouse and factory, and between departments.

Here's why: 1. Long, heavy, bulky materials handled *faster* in and out of storage.

2. Storage facilities utilized to maximum capacity—materials can be stored to greater heights.

3. Need for additional labor is minimized—costs are reduced—man-power can be released for other work.

FLEXIBLE, high-speed, cost-cutting ROSS Carriers and Lift Trucks will help your plant maintain the production necessary to meet today's urgent demands. Our experienced engineers and representatives are at your service, ready to help you solve your handling problems . . . Write today for Bulletin I-83.

THE ROSS CARRIER COMPANY, BENTON HARBOR, MICHIGAN

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THE UDYLITE CORPORATION

1651 E. Grand Blvd., Detroit, Mich.

Chicago, 1943 Walnut Street — Long Island City, N. Y., 11-16, 44th Drive — Cleveland, 4408 Carnegie Ave.

PRICES

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts:

	Per Cent Off List
½ in. & smaller x 6 in. & shorter	65½
9/16 & ⅝ in. x 6 in. & shorter	63½
¾ to 1 in. x 6 in. & shorter	61
1⅛ in. and larger, all length	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed:
(Hexagon or Square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
7/16 in. and smaller	..	64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 to 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full container lots, 10 per cent additional discount.

Stove Bolts

Packages, nuts loose	71 and 10
In packages, with nuts attached	71
In bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago, New York on lots of 200 lb. or over.

Large Rivets *(½ in. and larger)*

	Base per 100 lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$3.75

Small Rivets *(7/16 in. and smaller)*

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	65 and 5

Cap and Set Screws

	Per Cent Off List
Upset full fin. hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Fillister head cap, listed sizes	61

Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

RAILS, TRACK SUPPLIES

(F.o.b. Mill)

Standard rails, heavier than 60 lb., gross ton	$40.00
Angle bars, 100 lb.	2.70
(F.o.b. Basing Points)	*Per Gross Ton*
Light rails (from billets)	$40.00
Light rails (from rail steel)	39.00

	Base per Lb.
Cut spikes	3.00c.
Screw spikes	5.15c.
Tie plates, steel	2.15c.
Tie plates, pacific Coast	2.30c.
Track bolts	4.75c.
Track bolts, heat treated, to railroads	5.00c.
Track bolts, jobbers discount	63-5

Basing Points, light rails—Pittsburgh, Chicago, Birmingham; spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo; spikes alone—Youngstown, Lebanon, Pa., Richmond.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	$6.00	$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00

PRICES

ELECTRICAL SHEETS

(Base, f.o.b. Pittsburgh)	*Per Lb.*
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham

	Base per Keg
Standard wire nails	$2.55
Coated nails	2.55
Cutnails, carloads	3.85
	Base per 100 Lb.
Annealed fence wire	$3.05
Annealed galvanized fence wire	3.40
	Base Column
Woven wire fence*	67
Fence posts (carloads)	69
Single loop bale ties	59
Galvanized barbed wire†	70
Twisted barbless wire	70

*15½ gage and heavier. †On 80-rod spools in carload quantities.

WELDED PIPE AND TUBING

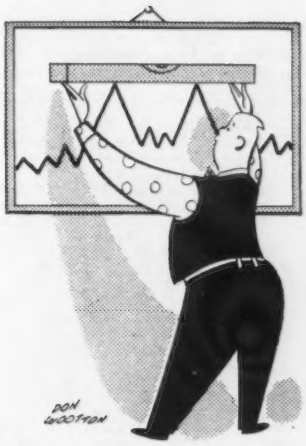
Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought pipe)
Base Price—$200 per Net Ton

	Black	*Galv.*
Steel (Butt Weld)		
½ in.	63½	51
¾ in.	66½	55
1 to 3 in.	68½	57½
Wrought Iron (Butt Weld)		
½ in.	25	3½
¾ in.	30	10
1 and 1¼ in.	34	16
1½ in.	38	18½
2 in.	37½	18
Steel (Lap Weld)		
2 in.	61	49½
2½ and 3 in.	64	52½
3½ to 6 in.	66	54½
Wrought Iron (Lap Weld)		
2 in.	30½	12
2½ to 3½ in.	31½	14½
4 in.	33½	18
4½ to 8 in.	32½	17
Steel (Butt, extra strong, plain ends)		
	Black	*Galv.*
½ in.	61½	50½
¾ in.	65½	54½
1 to 3 in.	67	57
Wrought Iron (Same as Above)		
½ in.	25	6
¾ in.	31	12
1 to 2 in.	38	19½
Steel (Lap, extra strong, plain ends)		
2 in.	59	48½
2½ and 3 in.	63	52½
3½ to 6 in.	66½	56
Wrought Iron (Same as Above)		
2 in.	33½	15½
2½ to 4 in.	39	22½
4½ to 6 in.	37½	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher on all butt weld.



IS THIS ON THE LEVEL?

By leveling off the peaks and valleys of production, industry can fulfill one of its greatest social obligations to this country—and to the men now in the service.

By providing steady, year-round employment for its workers, industry will also gain all the advantages of a stable, efficient labor force—loyal workers, low costs and high-quality products.

Will not 500 workers continuously employed throughout the year provide more buying power and better community stability than 1500 itinerant workers employed only 3 or 4 months during the year?

That is the question we will have to answer. It can and must be answered affirmatively.

There are many tools of management engineering which must be applied to this important leveling off operation. And it's none too early NOW to start plans aimed at making continuous Postwar Jobs. Our organization has been working for some time on such plans for a number of clients. Can we be of help to you?

Geo. P. Trundle Jr.
President

THE TRUNDLE ENGINEERING COMPANY

Consulting Management Engineering

GENERAL OFFICES · CLEVELAND · BULKLEY BLDG.
CHICAGO · City National Bank Bldg. · 208 S. La Salle Street
NEW YORK · Graybar Building · 420 Lexington Avenue

PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima. Delivered prices do not reflect 3 per cent tax on freight rates.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorus	Charcoal
Boston††	*$25.00*	*$24.50*	*$26.00*	*$26.50*	.....	.....
Brooklyn	*27.50*	.....	.....	*28.00*	.....	.....
Jersey City	*26.53*	*26.03*	*27.53*	*27.03*	.....	.....
Philadelphia	*25.84*	*25.34*	*26.84*	*26.34*	*$30.74*	.....
Bethlehem, Pa.	25.00	24.50	26.00	25.50	.....	.....
Everett, Mass.††	25.00	24.50	26.00	25.50	.....	.....
Swedeland, Pa.	25.00	24.50	26.00	25.50	.....	.....
Steelton, Pa.	.....	24.50	.....	.....	29.50	.....
Birdsboro, Pa.	25.00	24.50	26.00	25.50	29.50	.....
Sparrows Point, Md.	25.00	24.50	.....	.....	.....	.....
Erie, Pa.	24.00	23.50	25.00	24.50	.....	.....
Neville Island, Pa.	24.00	23.50	24.50	24.00	.....	.....
Sharpsville, Pa.*	24.00	23.50	24.50	24.00	.....	.....
Buffalo	24.00	23.00	25.00	24.50	29.50	.....
Cincinnati, Ohio	*23.94*	*23.94*	.....	*25.11*	.....	.....
Canton, Ohio	*25.39*	*24.89*	*25.89*	*25.39*	*32.69*	.....
Mansfield, Ohio	*25.94*	*25.44*	*26.44*	*25.94*	*32.86*	.....
St. Louis	*24.50*	*24.50*	.....	.....	.....	.....
Chicago	24.00	23.50	24.50	24.00	*35.46*	*$31.34*
Granite City, Ill.	24.00	23.50	24.50	24.00	.....	.....
Cleveland	24.00	23.50	24.50	24.00	*22.42*	.....
Hamilton, Ohio	24.00	23.50	.....	24.00	.....	.....
Toledo	24.00	23.50	24.50	24.00	.....	.....
Youngstown*	24.00	23.50	24.50	24.00	*22.42*	.....
Detroit	24.00	23.50	24.50	24.00	.....	$28.00
Lake Superior fc.	.....	.....	.....	.....	.....	33.00
Lyles, Tenn. fc.†	.....	.....	.....	.....	.....	
St. Paul	*26.76*	.....	*27.26*	*26.76*	*39.80*	.....
Duluth	24.50	24.00	25.00	24.50	.....	.....
Birmingham	20.38	19.00	25.00	.....	.....	.....
Los Angeles	*26.95*	.....	.....	.....	.....	.....
San Francisco	*26.95*	.....	.....	.....	.....	.....
Seattle	*26.95*	.....	.....	.....	.....	.....
Provo, Utah	22.00	21.50	.....	.....	.....	.....
Montreal	*27.50*	*27.50*	.....	*28.00*	.....	.....
Toronto	*25.50*	*25.50*	.....	*26.00*	.....	.....

GRAY FORGE IRON: Valley or Pittsburgh furnace $23.50

*Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable.

**Pittsburgh Ferromanganese Co. (Chester furnace only) may charge $2.25 a ton over maximum basing point prices.

†Price shown is for low-phosphorous iron; high-phosphorous sells for $28.50 at the furnace.

††Eastern Gas & Fuel Associates, Boston, is permitted to sell pig iron produced by its selling company, Mystic Iron Works, Everett, Mass., at $2 per gross ton above maximum prices.

Delta Chemical & Iron Co., Chicago, may charge $30 for charcoal iron at its Delta, Mich., furnace.

Basing point prices are subject to switching charges; silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 per cent to 2.25 per cent); phosphorous differentials, a reduction of 38c. per ton for phosphorous content of 0.70 per cent and over; manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent. Effective March 3, 1943, $2 per ton extra may be charged for 0.5 to 0.75 per cent nickel content and $1 per ton extra for each additional 0.25 per cent nickel.

PERFORATED METALS
ORNAMENTAL
Any Metal
Any Perforation
For INDUSTRIAL purposes a great variety of sizes and shapes of perforations are required, ranging from very fine to as large as 6" or more in diameter. We are equipped to supply all standard perforations in all kinds and thicknesses of metals.
ORNAMENTAL patterns are covered by our grille catalog. If interested, we hope you will send for it. There are attractive patterns for different uses.
INDUSTRIAL
The Harrington & King PERFORATING Co.
5667 FILLMORE ST., CHICAGO 44 • EASTERN OFFICE: 114 LIBERTY ST., NEW YORK 6, N. Y.

Metal Powders

Prices are based on current market prices of ingots plus a fixed figure. For ton lots f.o.b. shipping point, in cents per lb.

Copper, electrolytic, 150 and 200 mesh	21⅛ to 23½c.
Copper, reduced, 150 and 200 mesh	20½ to 25½c.
Iron, commercial, 100 and 200 mesh	13½ to 15c.
Iron, crushed, 200 mesh and finer	4c.
Iron, hydrogen reduced, 300 mesh and finer	63c.
Iron, electrolytic, unannealed, coarser than 300 mesh	30 to 33c.
Iron, electrolytic, annealed minus 100 mesh	42c.
Iron, carbonyl, 300 mesh and finer	90c.
Aluminum, 100 and 200 mesh.	*23 to 27c.
Antimony, 100 mesh	20.6c.
Cadmium, 100 mesh	$1
Chromium, 150 mesh	$1.03
Lead, 100, 200 & 300 mesh,	11½ to 12½c.
Manganese, 150 mesh	51c.
Nickel, 150 mesh	51½c.
Solder powder, 100 mesh,	8½c. plus metal
Tin, 100 mesh	58¾c.

*Freight allowed east of Mississippi.

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes, Minimum Wall. Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots.

	Seamless Cold Drawn	Hot Rolled	Lap Weld, Hot Rolled
2 in. o.d. 13 B.W.G.	15.03	13.04	12.33
2½ in. o.d. 12 B.W.G.	20.21	17.54	16.51
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3½ in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66

(Extras for less carload quantities)

40,000 lb. or ft., and over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

PRICES

CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago.....$54.80
6-in. and larger, del'd New York... 52.20
6-in. and larger, Birmingham 46.00
6-in. and larger f.o.b. cars, San Francisco or Los Angeles 69.40
6-in. and larger f.o.b. cars, Seattle. 71.20

Class "A" and gas pipe, $3 extra; 4-in. pipe is $3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is $45 at Birmingham and $53.80 delivered Chicago, $59.40 at San Francisco and Los Angeles, and $70.20 at Seattle. Delivered prices do not reflect new 3 per cent tax on freight rates.

LAKE SUPERIOR ORES

(51.50% *Fe, Natural Content, Delivered Lower Lake Ports**)

Per Gross Ton

Old range, bessemer, 51.50 .....$4.75
Old range, non-bessemer, 51.50 ..... 4.60
Mesaba, bessemer, 51.50 ..... 4.60
Mesaba, non-bessemer, 51.50 ..... 4.45
High phosphorous, 51.50 ..... 4.35

*Adjustments are made to indicated prices based on variance of Fe content of ores as analyzed on a dry basis by independent laboratories.

COKE

Furnace

†Connellsville, prompt $6.50*

Foundry

†Connellsville, prompt $7.50
Fayette County, W. Va. (Beehive). $8.10
By-product, Chicago $12.25
By-product, New England $13.75
By-product, Newark ...$12.40 to $12.95
By-product, Philadelphia $12.38
By-product, Cleveland $12.30
By-product, Cincinnati $11.75
By-product, Birmingham ....$8.50†
By-product, St. Louis $12.02
By-product, Buffalo $12.50

Maximum by-product coke prices established by OPA became effective Oct. 1, 1941.

*Hand-drawn ovens using trucked coal are permitted to charge $7.00 per net ton, plus usual transportation. Maximum beehive furnace coke prices established by OPA, Feb. 8, 1942. †F.o.b. oven.

FLUORSPAR

Pursuant to OPA Revised Maximum Price Regulation No. 126, effective July 1, 1943, to Aug. 29, 1943, base price per short ton is set at $33 for 70 per cent or more effective CaF_2 content; $32 for 65 but less than 70 per cent; $31 for 60 but less than 65 per cent; and $30 for less than 60 per cent. F.o.b. consumer's plant (1) plus either railroad freight on such shipment from the producer's shipping point to the consumer's plant, or (2) railroad freight on such a shipment from Rosiclaire, Ill., to the consumer's plant, which ever is lower. On and after Aug. 30, 1943, the maximum price f.o.b. a consumer's plant on any shipment of metallurgical grade fluorspar shall be $30 per short ton. Over $30 may be charged provided the producer receives specific instructions from the Steel Division of WPB to the effect that a specific consumer must have one of the higher grades, as provided in Section No. 4 (b).

REFRACTORIES

(*F.o.b. Works*)

Fire Clay Brick *Per 1000*

Super-duty brick, St. Louis ... $64.60
First quality, Pa., Md., Ky., Mo., Ill. 51.30
First quality, New Jersey 56.00
Sec. quality, Pa., Md., Ky., Mo., Ill. 46.55
Second quality, New Jersey 51.00
No. 1, Ohio 43.00
Ground fire clay, net ton 7.60

Silica Brick

Pennsylvania & Birmingham $51.30
Chicago District 58.90
Silica cement, net ton (Eastern).. 9.00

Chrome Brick *Per Net Ton*

Standard, chemically bonded, Balt., Plymouth Meeting, Chester $54.00

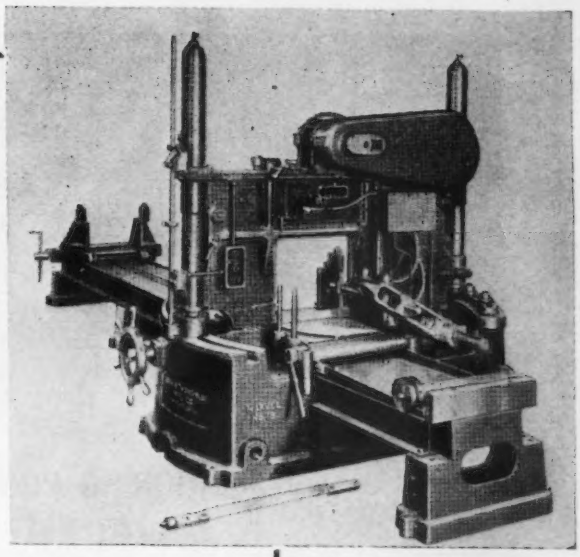
Magnesite Brick

Standard, Balt. and Chester $76.00
Chemically bonded, Baltimore 65.00

Grain Magnesite

Domestic, f.o.b. Balt. and Chester—in sacks (carloads) $44.00
Domestic, f.o.b. Chewelah, Wash. (in bulk) 22.00

CUTS the Toughest Steels and Largest Sizes *easily*.



This giant hydraulic metal - cutting saw is more than just a larger hack saw. It is a new development in metal-cutting methods that introduces a new principle of metal sawing — the Roll-stroke blade action makes it possible to cut the toughest steels in the largest sizes easily and rapidly. It also permits a simple and efficient, very low pressure Hydraulic Feed System.

Built for heavy work, completely enclosed in heavy housing, this machine will stand up under the rough usage of the average steel mill warehouse and forge shop, where it will speed cutting-off, and reduce material loss.

MARVEL No. 18

Giant Hydraulic Hack Saw

Capacity 18"x18"

Cuts angles up to 45° by simply swiveling upper machine housing.

Write for Catalog

MARVEL SAWS

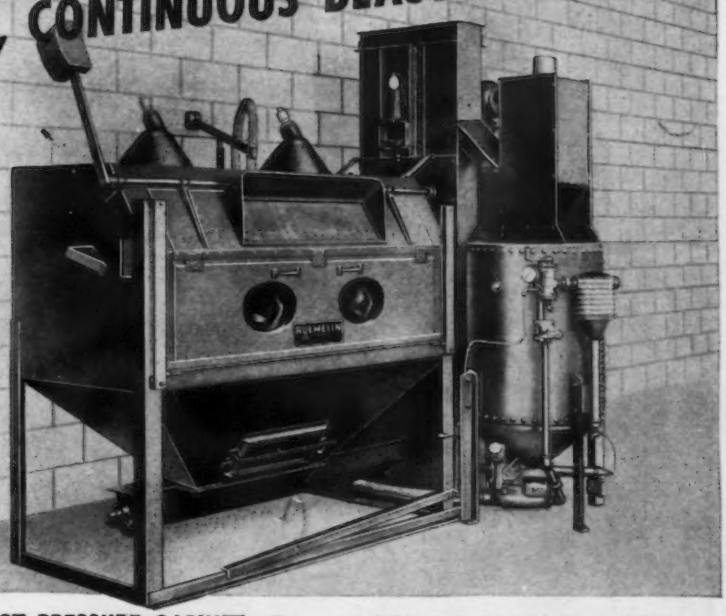
ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 Bloomingdale Ave., Chicago, U. S. A.

Eastern Sales Office
225 Lafayette St., New York

FAST, CONTINUOUS BLAST CLEANING!



DIRECT PRESSURE CABINET—Recommended for blast cleaning castings, forgings, heat-treated parts or wherever quick action is a necessity. Abrasive elevator system delivers cleaned abrasive to nozzle automatically. Cabinet size shown is 72" x 36". Other sizes available, including one with 60" rotary table. Write for bulletin 32-A.

• • •

Also manufacturers of Welding Fume Collectors, Abrasive Handling Systems, Cloth Dust Filters, Blast Rooms, and accessories.

RUEMELIN MFG. CO., 3870 N. Palmer St. Milwaukee, Wisconsin

RUEMELIN BLAST CABINETS

A 4098-½

6,000-lb. capacity unit.

In handling the cumbersome frame assemblies illustrated, the welders can swing them through 360° and tilt them as far as 135° beyond horizontal. Both men and women welders like Ransome equipment because it steps up their production and reduces fatigue.

POSITIONING PERMITS YOUR WELDERS TO CONCENTRATE ON WELDING . . .

It's certainly not good business to waste welders' time and energy in "rasseling" the work around . . . not when a Ransome Positioner will do the job at the touch of a switch.

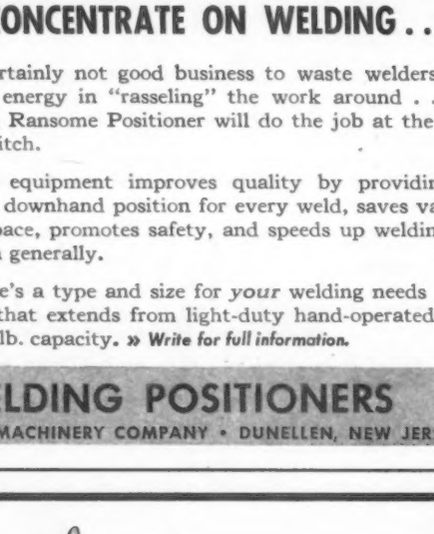
This equipment improves quality by providing the correct downhand position for every weld, saves valuable floor space, promotes safety, and speeds up welding production generally.

There's a type and size for *your* welding needs . . . in a line that extends from light-duty hand-operated up to 40,000-lb. capacity. » *Write for full information.*

Ransome WELDING POSITIONERS

INDUSTRIAL DIVISION • RANSOME MACHINERY COMPANY • DUNELLEN, NEW JERSEY

How many WORDS in a speech?



Usually too many, we think. We're not very long on words here at Dunbar's. Springmaking is our business and we prefer to stick to it. We'd rather show you how your spring may be improved, perhaps at lower cost—or possibly at savings in assembly time. We like to work on new spring developments, too. It's sort of a hobby with us.

Good spring action speaks louder than words!

DUNBAR SPRINGMAKERS

SPRINGS WIRE FORMS SMALL STAMPINGS

DUNBAR BROS. CO., Bristol, Conn.

Division of Associated Spring Corporation

Ferromanganese

78-82% manganese, maximum contract base price per gross ton, lump size, f.o.b. car at Baltimore, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.
Carload lots (bulk) $135.00
Ton lots (packed) 141.00
Less ton lots (packed) 148.00
Premium, $1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Electrolytic Manganese

99.9% manganese, maximum base contract price per lb. of metal, bulk, f.o.b. shipping point, with freight allowed to destination. Size, 1" x D.

	Eastern Zone	Central Zone	Western Zone
Carload lots	37.60c.	37.85c.	38.15c.
l.c.l. lots...	39.60c.	38.60c.	40.65c.

Spiegeleisen

Maximum base contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 1% max. Si	19-21% Mn 1% max. Si	26-28% Mn 1% max. Si
Carloads	$36.00	$37.00	$55.50
Less ton	47.50	48.50	62.00

Electric Ferrosilicon

OPA maximum base price cents per lb. contained Si, lump size in carlots, f.o.b. shipping point with freight allowed to destination.

	Eastern Zone	Central Zone	Western Zone
50% silicon	6.65c.	7.10c.	7.35c.
75% silicon	8.05c.	8.20c.	8.75c.

Spot sales 45c. per lb. higher for 50% Si; 30c. for 75% Si. For extras and premiums see MPR 405.

Silvery Iron

(Per Gross Ton, base 6.00 to 6.50 Si)
F.o.b. Jackson, Ohio $29.50
Buffalo 30.75

For each additional 0.50% silicon add $1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add $1 a ton for 0.75% phosphorus or over.

*Official OPA price established June 24, 1941.

Bessemer Ferrosilicon

Prices are $1 a ton above Silvery Iron quotations of comparable analysis.

Silicon Metal

OPA maximum base price per lb. of contained Si, lump size, f.o.b. shipping point with freight allowed to destination for l.c.l. above 2000 lb., packed.

	Eastern Zone	Central Zone	Western Zone
96% Si, 2% Fe.	13.10c.	13.55c.	16.50c.
97% Si, 1% Fe.	13.45c.	13.90c.	16.80c.

Ferrosilicon Briquets

OPA maximum base price per lb. of briquet, bulk, f.o.b. shipping point with freight allowed to destination. Approximately 40% silicon.

	Eastern Zone	Central Zone	Western Zone
Car Lots ...	3.35c	3.50c.	3.65c.

Spot prices ¼c. higher per lb. of briquet. For premiums and extras see MPR 405.

Silicomanganese

(Per gross ton, delivered, carloads, bulk
3.00 carbon $120.00*
2.50 carbon 125.00*
2.00 carbon 130.00*
1.00 carbon 140.00*
Briquets, contract, basis carlots, bulk freight allowed, per lb... 5.80c†
Packed ..... 6.05c†
Less-ton lots ..... 6.55c†

*Spot prices are $5 per ton higher.
†Spot prices ¼c. higher.

Ferrochrome

(65-72% Cr, 2% max. Si)

OPA maximum base contract prices per lb. of contained Cr, lump size in carlots, f.o.b. shipping point, freight allowed to destination.

	Eastern Zone	Central Zone	Western Zone
0.03% carbon ..	25.00c.	25.40c.	26.00c.
0.06% carbon ..	23.00c.	23.40c.	24.00c.
0.10% carbon ..	22.50c.	22.90c.	23.50c.
1.00% carbon ..	20.50c.	20.90c.	21.50c.
2.00% carbon ..	19.50c.	19.90c.	20.50c.

Spot prices are ¼c. higher per lb. contained Cr. For extras and premiums see MPR 407.

PRICES

Other Ferroalloys

Ferrotungsten, delivered, carlots, per lb. contained tungsten ...	$1.90
Tungsten metal powder, 98%-99%, any quantity, per lb.	$2.60
Ferrovanadium, 35%-40%, contract basis, f.o.b. producers plant, usual freight allowances, open-hearth grade, per lb. contained vanadium	$2.70
Special grade	$2.80
Very special grade	$2.90
Vanadium pentoxide, 88%-92% V_2O_5 technical grade, contract basis, any quantity, per lb. contained V_2O_5	$1.10
Ferroboron, contract basis, 17.50 % boron minimum, f.o.b. Niagara Falls, carlots, per lb. alloy	$1.20
Ton lots	$1.25
Silcaz No. 3, contract basis, f.o.b. Niagara Falls, all quantities, per lb. of alloy	23c.
Silvaz No. 3, contract basis, f.o.b. Niagara Falls, all quantities, per lb. of alloy	40c.
Grainal, f.o.b. Bridgeville, Pa., freight allowed 100 lb. and over, maximum based on rate to St. Louis, per lb.	45c.
Bortam, f.o.b. Niagara Falls	
Ton lots, per lb.	45c.
Less ton lots, per lb.	50c.
Borosil, 3% to 4% boron, 40 to 45% silicon, f.o.b. Philo, Ohio, per pound contained boron ...	$7.00
Ferrocolumbium, 50% to 60%, f.o.b. Niagara Falls, ton lots, per lb. contained columbium ..	$2.25
Less-ton lots	$2.30
Ferrotitanium, 40%-45%, f.o.b. Niagara Falls, N. Y., ton lots, per lb. contained titanium	$1.23
Less-ton lots	$1.25
Ferrotitanium, 20%-25%, 0.10 C max., ton lots, per lb. contained titanium	$1.35
Less-ton lots	$1.40
High-carbon ferrotitanium, 15%-20%, 6%-8% carbon, contract basis, f.o.b. Niagara Falls, N. Y., freight allowed East of Mississippi River, North of Baltimore & St. Louis, per gross ton.	$142.50
3%-5% carbon	$157.50
Ferrophosphorus, 18% electric or blast furnace, f.o.b. Anniston, Ala. carlots, with $3 unitage freight equaled with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage freight equalized with Nashville, per gross ton	$75.00
Ferromolybdenum, 55-75 per cent, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained molybdenum	95c.
Calcium molybdate, 40%-45%, contract basis, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained molybdenum	80c.
Molybdenum oxide briquettes, 48%-52% Mo, f.o.b. Langeloth, Pa., per lb. contained Mo	80c.
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per lb. contained Mo.....	80c.
Molybdenum powder, 99%, in 200-lb. kegs, f.o.b. York, Pa., per lb.	$2.60
Under 100 lb.	$3.00
Zirconium, 35-40%, contract basis, carloads in bulk or package, per lb. of alloy	15c.
Less-ton lots	16c.
Zirconium, 12-15%, contract basis, carlots, bulk, per gross ton.	$102.50
Packed	$107.50
Less-ton lots	$112.50
Alsifer (approx. 20% Al, 40% Si and 40% Fe), contract basis, f.o.b. Niagara Falls, per lb. ...	7.50c.
Ton lots	8c.
Simanal (approx. 20% Si, 20% Mn 20% Al), contract basis, carlots, f.o.b. Phila., Ohio, per lb. ton lots	9.50c.
Less-1 ton lots	10.50c.

No. 100 Decimal Timer

Graduated in decimal hundredths of a minute; sweep hand making complete revolution in one minute; total registration 30 minutes; "start-stop-and-fly-back" operation.

No. 105 Fifth Second Timer

Graduated in seconds and fifth seconds; sweep hand making complete revolution in one minute; total registration 30 minutes; "start-stop-and-fly-back" operation.

STOP WATCHES *Available for Delivery*

These instruments, produced in one of America's finest plants, contain a high precision, continuous running movement of seven jewels, encased in nickel.

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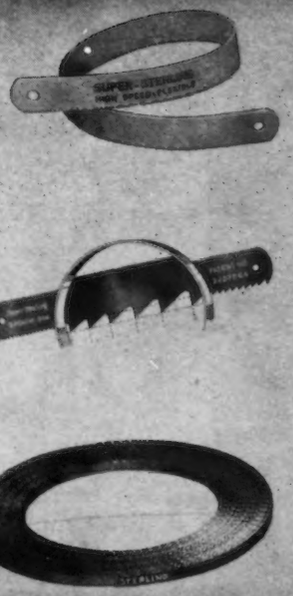

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The exclusive patented design of the Broach Saw puts it in a class by itself—for speed, ease of effort, clean cutting.

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Provides a milling effect rather than a hacking cut. The Broach Saw won't stick in the cut or chatter in the frame.

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DIAMOND SAW WORKS, INC.

BUFFALO, N. Y.

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MANY NEEDLESS OPERATIONS AVOIDED

BECAUSE EXECUTONE DESIGNERS CHECKED FASTENINGS

...used the simpler P-K Self-tapping Screw method where possible!

Executone engineers considered production speed, as well as performance, in designing their improved communication system, and planned, from the first sketch, for simplified assembly. For fastenings such as the nine in the units illustrated, P-K Self-tapping Screws were proved by thorough tests to be unequalled for speed, ease, and security.

Systems of Executone, Inc., New York, are in record demand for military and war plant installation. No time can be spared for clumsy, multi-operation assembly methods. With P-K Self-tapping Screws, tapping operations, tap sharpening, tap breakage and replacement can be avoided . . . training of new workers takes less time.

Uncover the Hidden Man-Hours In Your Work!

Every war production plant needs all the man-hours and tool hours P-K Self-tapping Screws can save. *Question every fastening job* on your production line, *now* . . . make sure you can't use Self-tapping Screws before you put-up with slower, complicated methods.

Call in a P-K Assembly Engineer to help you uncover opportunities to cut time with Self-tapping Screws. He'll show you that you can change to P-K Screws overnight. If you prefer, mail assembly details for recommendations. Parker-Kalon Corp., 200-204 Varick Street, New York, N. Y.

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SELF-TAPPING SCREWS FOR EVERY METAL AND PLASTIC ASSEMBLY